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The Canadian Medical Association Journal

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CANADIAN MEDICAL ASSOCIATION

Annual Meeting in Montreal—June 12th, 13th and 14th, 1923

Since our last issue, considerable progress has been made in the arrangements for the forthcoming Meeting.

Sir Berkeley Moynihan will address the Association on "Medicine in Art," and his address, which will be of general interest, will probably be delivered at an evening reception. Sir William Taylor is to deliver a paper on "Intestinal Obstruction" at one of the afternoon sessions. Sir Robert Jones will give a clinic on "Orthopaedic Surgery," illustrated with cases; while W. J. Mayo's contribution will be on "The Septic Factors in the Great Plagues." These visitors will all participate in the general programme throughout the meeting.

The Programme Committee has arranged for sectional clinics in the following hospitals: Hotel Dieu, Notre Dame, Royal Victoria and Montreal General; Montreal Maternity and Misericorde; St. Justine and Children's Memorial.

Each hospital has its own programme subcommittee. The chairmen of these committees are members of the general Programme Committee and in this way coordination and correlation are obtained.

There will be a special section of the Ophthalmological and Oto-Laryngological Departments, and a number of important visitors from the States and elsewhere are expected.

In the afternoon sessions, the papers will be delivered extemporaneously, *i.e.*, instead of the usual custom of reading papers, contributors will be invited to present their communications in an abstracted form with a time limit of ten or fifteen minutes. This will enable every contributor to gain a hearing. Papers so delivered will be published *in extenso* in the *Journal*.

A Programme on Special Subjects is being arranged, and guests from all over the country will be invited to contribute, so that a systematic discussion of the subjects in hand may take place.

The Committee on Entertainment has not been idle. A banquet will take place on the second evening of the meeting in the large banqueting hall of the Mount Royal Hotel, where more than 600 guests can find ample accommodation. It is proposed to entertain the ladies at the same time at a separate banquet, or it may be that the banquet itself will be open to ladies as well. It is hoped that many of the members will be accompanied by ladies, for whom ample entertainment will be provided. Arrangements are being made for luncheons and receptions at the Hunt Club and in various private houses, and the Royal Montreal Golf Club will be open to those who wish to make use of it.

Attention is again drawn to the wonderful accommodation provided for exhibitors. The hall, which is 170 ft. x 50 ft., is flooded with light and affords magnificent space for those who wish to make their exhibits attractive.

Registration of members takes place in the centre of this hall, so that everyone attending the convention will come in close contact with the exhibits.

Daily lunches are provided in a separate hall of the hotel, with accommodation for at least 400, so that the members may thus meet together, and in this way a full attendance will be secured for transaction of business and for short addresses during that time.

It is anticipated that at least 800 visitors will attend the meeting, which should exceed all former records.

MEDICAL EDUCATION AND THE ONTARIO MEDICAL ASSOCIATION

J. Heurner Mullin, M.D.

Hamilton

I HAVE been instructed by our President to write a short account of the activities of the Committee on Education, together with an outline of its possible scope and function. This Committee was originally created for the purpose of providing university post-graduate instruction for the members of the County Medical Societies at their places of meeting; although the name has been changed, the activities have, almost entirely, been of this character. During my term of office, it was repeatedly brought to my notice how much the work of the various committees interlocked; and how important it was, in considering any one problem, to give due regard to all others which in any way were affected by, or in any way related to it. Therefore, before proceeding with my story, I would request each reader to ask himself a few questions, and, from his own viewpoint to supply the answers which appear to him to be satisfactory.

Why does the profession require post-graduate education? Are we, as a profession, prepared to supply the best possible service to the public as a whole, and to those whom we meet individually in our daily work? What is meant by the best medical service? Should we discuss merely the quality of the service, or extend this question to cover the type or plan for providing this service, both to individuals and to the community as a whole? Do we agree that, in the future, medical practice will only require specialists, surgeons, private group clinics, and public health officials? Are we to sit still and watch the efforts of those who are without our ranks, when they attempt to prevent distress when it affects one or threatens the whole community? Are we, as members of a group, so intensely individualistic in our instincts that we cannot be organized in our own interests, or for that service which we must provide for all the other members of society? Or will the medical profession rise to the occasion and take some real interest in revising all of our methods, and, by organization, make collective action more powerful for good as well as for protection?

It is evident that on these and other questions which might properly be presented, much thought should be given before decisions can be reached. I am sure that all those who have given, or are willing to give these matters any extensive study, will eventually agree that, no matter what changes may come, no system will be developed which will satisfactorily do the work unless we maintain that individual relationship between the patient and his doctor, which has been recognized as a most desirable fundamental in British medicine for many generations. Many will agree that even the preventive side of medicine should include the foregoing principle, and that, in the final solution, it will be found impossible to completely separate the preventive from the curative side.

The best British schools have long recognized the first necessity of graduating good general men, and their curricula are based on this principle. Those graduates who wish to become expert in any department spend years of post-graduate study before announcing themselves as consultants.

Our profession in Ontario, through the Ontario Medical Association, should at least be in a position to give some guarantee to the public that we are doing our utmost to keep up to a high standard the quality of service which our individual members may be expected to supply on demand. It must be our first duty to assist in the development of the man in general practice. It is now several years since one of our members, Dr. McKenzie, of Alliston, very properly brought the subject of post-graduate education to the attention of the Royal Commission on Medical Practice, and thus publicly presented the necessity for taking into account the State's obligation to see that at least a greater opportunity than at that time existed should be given to graduates in practice to refresh their minds by some form of post-graduate instruction and study. No doubt it had occurred to many that much better opportunities were at that date offered to the lay public by means of the university extension courses.

in the arts and sciences, and in literature; the State had also realized the necessity for posting the farmer on how best to look after his cattle, but had done little to keep the medical profession abreast of the times in the interest of the great masses of the public, the human family in this fair province.

The first Committe on Education of the Ontario Medical Association with Dr. McKenzie as Chairman, took active steps to supply the need, and in its pioneer efforts, as presented in their first report, we have the foundation of what must be a complete revolution in this our viewpoint regarding the duty of the university in things medical to its graduates, and, through them, to the community at large in various parts of the province. The three universities in the province were invited to assist, and, in addition, other prominent and able members of the profession.

No doubt many of our members are sufficiently familiar with our plan, the recent growth of the movement, and last year's record under the auspices of the Ontario Medical Association. We have reason to believe that, with due regard to population, this record has not been equalled in any other part of the British Empire, or in any one of the United States. For the benefit of those who lack this information, this short account is now presented. A schedule was prepared giving a list of topics, and these, from all sources, were listed under various department headings. This schedule was mailed to all the profession in Ontario, residing outside of Toronto. During the past year, with the splendid cooperation of the Department of Health of Ontario, and with the generous contribution of $5,000.00 from the Ontario Red Cross Society, it was made possible for our Directors to offer to pay from the Association funds, the expenses of travel and a nominal honorarium for six speakers sent to each County Society. During the coming year, owing to the increase of our provincial fee and the continued Red Cross support, it will be possible to send eight speakers on the same basis.

The various County and local Societies were encouraged to take advantage of this schedule in augmenting their regular programmes, or in providing special courses. These could be arranged for according to the following plans: (A) Individual lectures forming the main part of local society meetings. (B) Individual lectures apart from regular society meetings. (C) Lectures in series. Each county was permitted to make its own selection as to topics and plans. By this method a truly democratic spirit was maintained and local societies were encouraged to manage their own affairs.

The schedule was printed without names attached to various topics for very obvious reasons; but the names of the proposed lecturers were made readily accessible to the secretary of any society, after the topic had been selected. During the past year, a total number of ninety-nine speakers were made available for the purpose of the schedule, each speaker having indicated to our central office the number of times he was willing to go out during the year.

The following is a list of some of the popular subjects, the figure showing the number of times selected: "High Blood Pressure", 18; "The Pathology of Gall Bladder and Bile Ducts, and its Relation to the Clinical Manifestations of Disease, and the Surgical Treatment indicated", 9; Obstetrical Injuries and their After-results, with special reference to Prevention", 8; "The Diagnosis, Prognosis and Treatment of Cardiac Irregularities", 8; "The Differential Diagnosis of Pain in the Back", 8; "The Diagnosis and Treatment of Goitre", 8; "The Diagnosis and Treatment of the Commoner Skin Affections", 7; "Inflammatory Diseases of the Pelvic Organs", 6; "The Interpretation of the Signs and Symptoms of Chronic Gastro-intestinal Disease", 5; "The Surgical Emergencies of General Practice", 5; "Symptomatology of Pelvic Disease", 5;

In addition to the above, a number of lectures were given under the auspices of the Provincial Board of Health in various parts of the province without any charge being made on the local organizations. We wish to acknowledge the whole-hearted support of the Chief Officer of Health of the Province, which support made these lectures possible. The following chart shows to what extent the opportunity was used; namely, 186 individual lectures were given to thirty-one County Societies. In addition, there were nine Counsellor District Meetings, at which fifty-five speakers assisted, making a grand total of 231 speakers sent out under the auspices of our Provincial Association.

The chart which follows show that the number of lectures requested by a County Society bears little, if any, relation to the number of the medical population, but rather should be taken as an index of the activity of the executive officers of each society. We have no complete information regarding the actual number who attended the lectures at each County Meeting. The percentage of the number who have recognized the advantage of being members in the Ontario Medical Association is listed as a matter of record. This should certainly be increased—except in the case of Thunder Bay (100%) as the advantages of the provincial organization become better appreciated. Nineteen other counties are not listed; either these are not organizedt, heir executive officers are asleep, or they have taken other methods of supplying educational facilities for their members, independent of our central office.

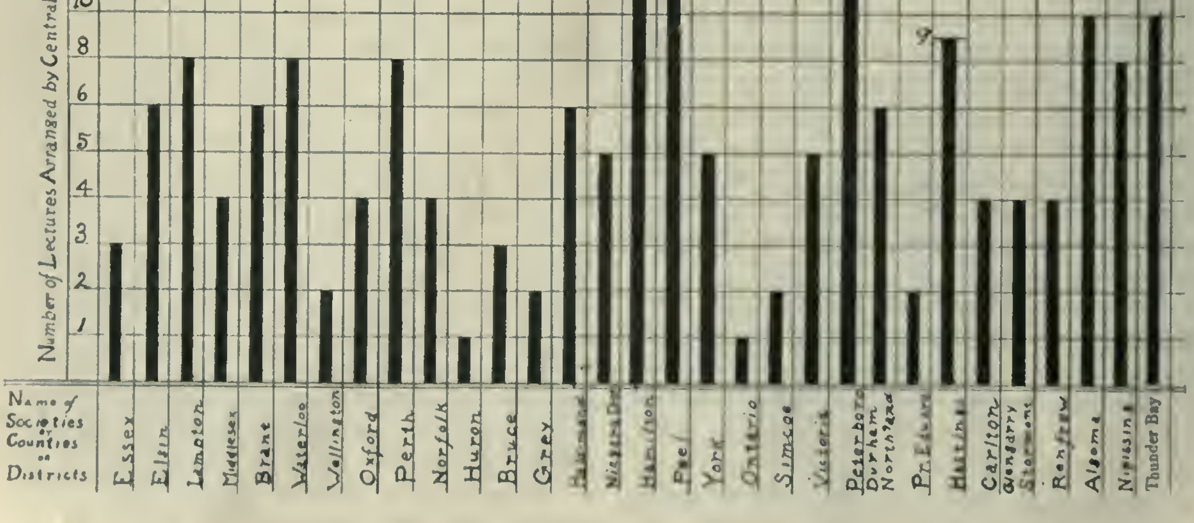
The cities of London and Toronto have each of them an active Academy of Medicine whose programme is not included. The local society of Kingston is only partially shown. Each of these cities has a University with a Medical Faculty, and it would be impossible to estimate here the benefits which they distrbiute to those who are favoured by such environment.

In the city of Hamilton, there is an active Medical Society, and additional courses were independently arranged. A total of fifty-five lectures during the year stands to its credit. Here, and probably in the case of other city medical societies, the programme of the local society for its regular meetings, was arranged quite separately from the stated post-graduate courses.

But the record is not enough; changes are rapidly taking place in medical thought and practice, and along with this, the complete question of medical service to both the sick and the well must receive our attention. The earliest advocates of State Medicine based their chief argument on the presumption that the public does not get the best kind of service, which can be provided if these advances are to be made available for all. In this they were probably right; but what about the remedy?

In preparation for the work of the coming year, the schedule has been completely revised. Each university Medical Faculty has been requested to revise its list of topics. In addition to this, all the members have been circularized and requested to offer to read papers which bear the endorsement of their own local society.

Each County Society in addition to those lectures which are supplied free of cost from the central fund, should arrange for other speakers in large numbers. If these were grouped together in a definite post-graduate course under the local Committee on Education, and a nominal charge levied on those who attend, it should not be difficult to finance their programmes. Some



years ago, a group of twenty-five dentists in Hamilton invested $3,000.00 in one year; they found that it paid, and have had similar courses in the later years. Surely the medical profession can do likewise.

The various plans which have been elaborated are here briefly discussed for the benefit of those who wish to revise or extend their scope of activities. Any plan may be modified according to the wishes of the local group.

(A) *Individual lectures forming the main part of local society meetings:* This plan has been in operation in the past, and constitutes the procedure adopted by a large majority of the county societies. Those societies that wish to continue this method should assist their officers by supplying other features on the programme, possibly co-related with the subject; and in every case, presentation of pathological specimens and clinical histories should be encouraged.

(B) *Individual lectures apart from regular society meetings:* Under this plan, the members in the county societies who wish to form a group for the purpose of taking this post-graduate instruction, arrange for meetings apart from the dates of regular meetings The various topics and speakers for single lectures on various subjects are selected according to their wishes.

(C) *Lectures in series:* This plan will almost certainly be accepted, sooner or later, by all those who have tried the previous method. Three or more lectures properly correlated as to material and in proper sequence would be given; fully sufficient to cover any particular field.

(D) *Team work:* This plan has been carried out in the State of North Carolina, and can be arranged by having a team of men who would tour the province according to a convenient method planned by the central office. Each team could spend one or more days in one town and then move on. On the other hand, each local society could ask for any team they specially desire. In each town, there would be held both morning and afternoon sessions, and, if possible, clinics on cases which have been previously worked up by the local group.

(E) *Summer Camps:* This plan has been suggested with the object of including many of the features described above, and covering the field of study in a more intensive manner. A suitable site would be chosen in one of our northern holiday districts, and a more or less permanent camp set up in the midst of the woods adjoining one of the inland lakes or rivers. This would be opened to groups of practitioners for periods of two weeks or more, and might be further developed to include the families of the groups. In this way, members would be able to avail themselves of the opportunity of combining rest with pleasure and a limited amount of medical work. Definite lecture hours would be arranged, and the programmes prepared according to the expressed wishes of those participating.

(F) *The Seminar Method:* This method would be confined to our larger centres, where a small group of men wished to cover a certain amount of the literature on a given subject. In this case the same lecturer would go at more or less frequent intervals. He would assume the position of leader of study. Each of the members of the group would be expected to play an equal part in handling his portion of the literature to be covered. Round table discussion would add the feature of informality and would increase the interest. This method would, of course, be limited and would require regular attention on the part of all the individuals in the group.

Whether or not other plans may be suggested, the future will decide. With all of the above plans, every possible effort should be made to enlarge the scope of the clinical side, and the practical application of the topics presented. The directors of the Ontario Medical Association have purchased several view-boxes and lanterns for use where these are not available. The question of suitable blackboards with various coloured chalks, etc., should certainly be a local obligation.

The following chart indicates that the committee, with the cooperation of the universities and others, has been able to increase the number of lectures which are available and from which each county society may make its selection.

Number of Topics in Various Departments

Department	1920-21	1922-23
Internal Medicine..........	47	84
Paediatrics................	12	18
Surgery....................	32	61
Obstetrics and Gynaecology.	10	27
Therapeutics and Pharmacology..................	14	19
Hygiene and Preventive Medicine................	5	14
Oto-Laryngology...........	7	13
Pathology.................	8	20
Physiology and Biochemistry	20	21
Radiology.................	4	22
Miscellaneous.............	0	8
Total.....................	159	307

We have observed the conditions which have arisen across the Border, where in many states they find the cities overcrowded with doctors while in some rural communities upon the death or removal of an old practitioner it has been impossible to attract the younger men, fresh from their academic experiences. Should we not, therefore, especially interest ourselves in the man in rural practice, and assist in maintaining his interest in modern medical affairs? Several who have had the privileges of attending our District Meetings have noted the high average of ability exhibited by the papers read, and the splendid type of the discussion. While some lack the familiarity with modern methods, many have individually made up for this, in large part, by the opportunities of a wide and varied experience. Their judgment in many cases would put some of our city brethren to shame.

Much is being done to make life easier for all classes in our rural communities; good roads, motors, telephones, electricity for light and power, moving pictures and the radio; but what about improvement in medical facilities? Where are the laboratories and small-community hospitals that would give those citizens who produce the bulk of our wealth, the bare necessities in serious emergencies? Our educational programme has compelled the members to do some thinking. Already our members in various parts of the province are asking for these laboratories and hospital facilities. Should these things become realities in large numbers and be intelligently made use of, our teachers will be more fully repaid for their labours than they can possibly expect to be from the modest honorarium it is now possible to offer.

In closing, may I express, on behalf of the Committee, appreciation and gratitude to those teachers from our universities and others of the profession, many of whom, at great sacrifice of time and energy, have gone throughout the province and assisted in making the work under this schedule possible. The executive work has been small indeed, compared with the sum total of the efforts of the speakers, whose ever-ready spirit of cooperation, has added pleasure to the work entailed in carrying out all the necessary arrangements.

THE TREATMENT OF NEPHRITIS

Edward H. Mason, M.D.

Montreal

To anyone practicing internal medicine, the extensiveness of nephritis is well known. In the U. S. Bureau of Census reports for 1916, it stood third in mortality statistics, being preceded by pulmonary tuberculosis and organic heart disease only. Most Insurance companies find that Bright's disease ranks fourth as a cause of death, and when we consider that these figures do not include the majority of cases of acute nephritis, its importance can hardly be over-estimated.

Nephritis is in some respects a misnomer. "Itis," strictly speaking, implies inflammation, thereby including all the pyogenic diseases of the kidneys. Again, many of the commoner non-suppurative kidney lesions are degenerative, rather than productive, but due to its long usage and general understanding, it is better to retain the term nephritis, thinking of it as a non-suppurative, proliferative or degenerative lesion of the kidney substance.

Classification of nephritis has always been a stumbling block. Shall it have an etiological, pathological, or functional basis? One based upon etiological principles would, perhaps, be the most satisfactory, if we knew more of the causes of nephritis, but at present it is impossible. Due to our frequent inability to correlate pathological and clinical findings, a classification based upon morbid histology has never won acceptance with the clinician. This is largely due to the extensive structural alteration that takes place in chronic disease, leaving little resemblance to the original altered histology. The remaining classification is related to function, the one thing that lends an aspect to each case, that can be determined clinically with the aid of the laboratory, and after all, function is of the greatest importance to the patient. It determines life or death.

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*Paper read before Meeting of Montreal Medical Chirurgical Society, October 20th, 1922.

Until we understand more about nephritis, it is better to keep our classification simple, based upon functional principles, a guide and a means of indexing each case in our clinical work. From this standpoint, such a division, as suggested by Dr. Christian, is satisfactory.

1.—Acute Nephritis.
2.—Chronic Nephritis.
    (a) with oedema;
    (b) with hypertension;
    (c) mixed.
3.—Essential Hypertension, (may progress into chronic nephritis).
4.—Renal Arteriosclerosis, (progressing into chronic nephritis).

Such a grouping is quite clear, I think and needs very little explanation, but we must recognise that a case may pass from one group into another with progress of the disease process. For example: originally there may be an acute nephritis, passing with the years, as so frequently happens, into a chronic nephritis with oedema, later becoming a mixed type manifesting both oedema and high blood pressure. With still further constriction of the kidneys, the oedema largely disappears, hypertension being the outstanding feature.

A good example of the progress of a nephritic lesion is shown in Chart I, which depicts the findings in a male, aged eighteen years, admitted to the hospital in May 1920. Upon admission the diagnosis was chronic parenchymatous nephritis with extreme oedema, the urine being characteristic, with no retention of non-protein nitrogen in the blood. Further, the blood pressure was low and there were no retinal changes. A few months later all the oedema had disappeared and the true weight of the patient was 36 kg., being only a little more than 50% of that upon admission. In two and one half years' time, the picture had quite changed. Now (October 1922) there is marked inability to concentrate, albumen and casts have largely disappeared, and there is marked retention of non-protein nitrogen in the blood. Also the blood pressure shows a tendency to rise, but the fundi still remain negative.

Renal Functional Tests. Renal functional tests have a definite value in the understanding and treatment of nephritis. They tell us what the kidney can do; in that way helping us to intelligently regulate the intake of the patient. The best tests are, (1) The phthalein test for the determination of the total kidney function. (2) The nephritic test meal, giving information as to the quantity of night urine, variation of specific gravity, and the ability to concentrate nitrogen at night, and (3) The estimation of the non-protein bodies in the blood. These tests have their greatest value when considered together and in conjunction with the history and physical examination of the case. Repeated at intervals they give information relative to the change in function. Again they help to individualize each case, so important for its proper treatment.

Treatment. The treatment of acute and chronic nephritis is based upon one principle. Physiological rest, both of the body as a whole, and of the kidney in particular, is the goal aimed at, hoping, in the acute cases for repair and in the chronic cases, for arrest of the disease process. In dealing with the details of the treatment, it will be clearer to consider acute and chronic nephritis separately.

1.—*Acute Nephritis:* Here we are dealing with an acute inflammation of the structural secreting unit of the kidney, usually toxic in nature. The following procedure is usually advisable. (a) Rest in bed until red blood cells disappear from the urine; preferably until casts and albumen disappear as well. Hope should be

CHART 1

		Urine			*Blood*					
Date	*Weight*	*Sp. Gr.*	*Albumen*	*Casts*	*Urea*	*Creatinine*	*Phthalein*	*Œdema*	*Blood Pressure*	*Fundi*
	Kg.	Max. Conc.			Gm. per litre	Mgm. per 100 cc.	2 Hrs.		Mm. Hg.	
1920—May...	69	1034	++++	+++	0.3	1.0	20	++++	100/80	Negative
1921—Jan....	44	1020	+++	+	0.6	2.1	10	+	120/85	"
1922—May...	60	1016	++	+	0.9	3.5	7	+	115/85	"
1922—Oct....	57	1012	+	few	1.1	5.5	ft. trace	+	135/85	.

entertained for at least four months that the acute condition will not progress into a chronic one. (b) Activity of bowels and skin. (c) Elimination of foci of infection. which not infrequently have a definite etiological relation to the inflammation; (such as infected tonsils, alveolar abscesses, or other pus pockets). (d) Diet: During the acute stage, a milk diet is probably the best, 800 to 1000 cc. of milk per day, but this should not be kept up too long as it is subcaloric. Gradually increase to 1800-2000 calories keeping the protein and salt low. (Protein 30 to 40 grams.). Such a diet can be made up from cream, butter, bread, sugar, potato, oatmeal, vegetables and fruit, the calories being given largely in the form of carbohydrates and fat. From this diet one can increase the protein gradually up to 60 grams. per day, but protein intakes above that level should not be allowed until all evidences of nephritis have disappeared. Salt restriction does not need to be so severe with convalescence. (e) Fluid: As it is unusual to have extreme oedema in acute nephritis a fluid intake of from 1,000 to 1500 cc. is usually satisfactory. This can be increased to 2000 cc. later if desired. (f) Surgical treatment in acute nephritis finds no place, except in certain cases of complete anuria in children, where decapsulation might be considered.

Such is a general outline of treatment in acute nephritis. Each case, however, must be individualized and this can best be done through functional studies. Thereby the finer indications can be treated; also as the case improves, functional studies are our best guide in judging the amount of restoration of kidney structure, and accordingly of permissible dietetic increases.

Chart II shows the satisfactory improvement of a case of acute nephritis in a boy of five years, and 17kg. weight. The etiology was doubtful.

To understand acute nephritis, it is necessary to follow the case over a long period of time. Such a case is shown in Chart III, a male, aged fifty-five years, admitted to the hospital in November, 1916, with acute nephritis. The results show complete restoration of function.

2.—*Chronic Nephritis:* The principles of affording physiological rest to the kidney applies no less in chronic nephritis, and especially in acute exacerbations of a chronic lesion, as it is at these times that the lesion tends to progress more rapidly. A proper study of the case includes the

CHART II.

Date	*Intake*		*Urine*			*Blood Urea*	*Phthalein*
	Protein	*Total Calories*	*Albumen*	*Casts*	*R. B. Cells*		
	Gm					Gm. per Litre	2 Hrs.
1922 May 27	33	712	++++	++	++		
May 30	35	860	+++	+	+		
June 9	50	1143	+	0	0		
June 20	50	1143	Trace	Few	0		
June 30	60	1223	Faint Trace	0	0	0.3	85

CHART III.

Date	*Intake Protein*	*Urine*				*Blood Urea*	*Phthalein*	*Œdema*	*Blood Pressure*
		Max. Conc.	*Albumen*	*Cast*	*R. B. Cells*				
	Gm.					Gm. per litre	2 Hrs.		Mm. Hg.
1916—Nov.	Low	1015	++	++	+	0.86	63	Slight	185/110
Dec. 6	Low	1017	+	+	0	1.25	Trace	0	155/100
1917—Jan.	Low	1025	Trace	Few	0	0.40	42	0	150/90
1918—Jan.	Restricted	1027	Trace	0	0	0.38	50	0	135/80
1919—Feb.	Restricted	1030	+	0	0	0.39	52	0	130/80
1920—July	Restricted	1032	Trace	0	0	0.38	60	0	120/80
1922—Oct.	Restricted	1035	Faint Trace	0	0	0.30	68	0	115/70

thorough determination of kidney function, repeated at intervals, and upon the results obtained our treatment must be largely based. Oedema and salt retention indicate the restriction of fluid and salt. Retention of non-protein nitrogen in the blood should guide us in our protein administration. General principles as outlined under acute nephritis apply in chronic. It is important that, unless we are dealing with an acute exacerbation we should make use of fat and carbohydrates, and the diet should not be subcaloric. These are burned to CO_2 and water in the body, and their waste products throw no strain upon the kidney. Above all in chronic nephritis we must individualize as each case has its own peculiarities. By attending to many of the minor disorders, a better chance is given for repair to the kidney.

Diuretics: Diuretics in nephritis are altogether too widely used. Careful studies, largely from the clinic of Dr. Christian, have shown that in few cases of true nephritis have they been of any value. There may be a temporary stimulation of function, but that is followed by a marked slump with the result that the case is worse off than before. In acute nephritis there is little occasion to use a diuretic except to tide over an emergency. In chronic nephritis one is more frequently tempted. Water is our mildest diuretic and in certain cases may be justly tried, as there is no proof that it is easier for the kidney to eliminate substances in concentrated than in dilute form. In our experience the most satisfactory results have been obtained from the use of glucose intravenously to the point of slight glycosuria. This has been given in a 20% solution, 300 cc. twice a day. We believe that glucose has a definite value in meeting an emergency, especially in those kidneys where there is a marked depression of kidney function with but little altered anatomical structure. In the more chronic types, with extensive pathological alteration, temporary improvement can undoubtedly be obtained, but the fatal termination is only delayed.

A good example of the value of glucose intravenously to meet an emergency is shown in Chart IV, depicting the results obtained in a male, aged sixty-nine years, admitted to the hospital with seven days complete anuria.

Acidosis: As is well known many cases of nephritis, especially those of the advanced chronic type, develop a marked acidosis, it being in some cases the immediate cause of death. The cause of this acidosis is due in part to the inability of the kidney to eliminate the normal amount of acid phosphate (NaH_2PO_4), thereby retaining in the blood excess of phosphates which deplete the body of its sodium reserve. This results in the lowering of the blood CO_2. The symptoms associated with this acidosis are mainly respiratory, in the form of deep laboured breathing, and this can be promptly abolished by treatment. This is done by supplying a base to the body, usually sodium bicarbonate, best given by mouth or by rectum, and as a last resort intravenously. Its administration should be carefully controlled, preferably by the blood CO_2 or by the urinary acidity, as with poorly functioning kidneys one may easily produce an alkalosis. Such an acidosis was found in a case of chronic nephritis admitted with a blood CO_2 volume percentage of 17.5, and 11.7 mgm. of inorganic phosphates (as P.) per 100 cc. After 60 gm. of sodium bicarbonate had been given the CO_2 had risen to 67 volume percentage and the phosphates had fallen to 5.7 mgm. per 100 cc.

Œdema: Œdema is one of the most interesting and complicated manifestations of nephritis; of little importance in the acute types, it over-shadows the picture in many of the chronic cases. Not uncommonly it increases the weight

Chart IV.

Date	*Fluid*		*Urine*		*Glucose Intravenously*
	Intake	*Output*	*Total N.*	*Glucose*	
	cc	cc	Gm.	Gm.	Gm.
1922 Aug. 4	1390	0	0	0	90
Aug. 5	2520	1545	5.5	4.6	150
Aug. 6	4630	3910	15.1	7.9	152
Aug. 7	4300	4410+	16.8+	3.6+	180
Aug. 8	4650	2290+	8.5+	7.6+	180

of the patient 100%. In the past we have thought œdema to have a relation to the retention of sodium chloride in the body, either in the blood stream or in the tissues. Frequently it appears to be due to the retention of sodium chloride by the tissues as the actual plasma chlorides fall to very low values, considerably below the normal threshold of 5.62 grams. per litre concentration. With the return of the salt into the blood stream the diuresis commences. Present thought tends towards the opinion that œdema is secondary to the balance of ionized radicles between blood and tissue lymph, rather than to the total salt concentration. Our treatment of œdema is poor. We usually restrict fluid and salt. In some cases improvement is immediate, but such is not the rule. Chart V shows the average result obtained with our present method of treating œdema in a bad case of chronic nephritis, aged eighteen years.

Nephrosis: A few years ago Epstein described a type of chronic nephritis associated with marked œdema, and scanty concentrated urine containing an abundance of casts and albumen, low blood pressure, with an ability to handle nitrogen end products in a normal manner. These cases showed an altered blood protein ratio, albumen to globulin, with a high blood cholesterol. Epstein thought that the condition was a general systemic disease, the kidney changes being secondary and degenerative in nature. He used the term nephrosis and advised treatment to consist of a high protein diet with transfusions. The œdema was thought to be due to the altered blood proteins acting in some way through their osmotic pressure. How this could be is difficult to imagine as the total normal blood proteins only exert an osmotic pressure of 30 to 32 mm. Hg.

A case falling into this type has been studied in our clinic since May, 1920. Data have been obtained showing that the œdema had little relation to the altered blood proteins. This is well shown in Chart VI, the basic weight of the patient being 36 kg. With the loss of the extreme œdema there was practically no alteration in the blood proteins, the globulin fraction still remaining in excess of the albumen.

Conclusions: The question of nephritis is a difficult one. In many cases we are acquiring data over short periods of time, but for the comprehensive understanding of the disease data must be collected over long periods in the same case. How many of us know what percentage of our cases of acute nephritis pass into a chronic condition? We see too many end results.

Other problems that are unsolved are the following: the effect of various amounts of protein in nephritis over long consecutive periods; the effect of various kinds of protein, animal and vegetable; effect of various fluid intakes; the exact

Chart V.

		Intake				*Urine*			*Blood*		
Date	*Weight*	*Protein*	*Total Calories*	*Fluid*	*Salt*	*Volume*	*Sp. Gr.*	*Albumen*	*Urea*	*Chlorides*	*Phthalein*
	Kg.	Gm.		cc	Gm.	cc		Gm. per litre			2 Hrs
1922 Jan. 28	55	32	870	1000	0	500	1026	12	0.30	6.22	31
Feb. 18	61	33	764	1000	0	400	1036	15	0.22	5.75	40
April 1	36	50	1400	1500	0	1200	1013	0.2	0.20	6.00	52
April 30	39	52	1400	1500	0	1100	1012	+	0.20	6.15	57

Chart VI

		Blood Proteins		*Blood*	
Date	*Weight*	*Albumen*	*Globulin*	*Chlorides*	*Urea*
	Kg.	%	%	Gm. per litre	Gm. per litre
1920—May 21...........	69	1.40	2.08	5.80	0.39
June 20...........	61	1.71	3.29	6.50	0.34
July 20...........	41	2.76	3.42	6.55	0.24
Aug. 1............	36	1.69	2.78	5.85	0.38

nature of acidosis in nephritis; and the big question of œdema.

Some of these problems will be solved, but I think that an aiding factor will be a closer union with chemists and physicists in our hospitals. We clinicians are not physical chemists, but we must employ men with such training if we hope to forge ahead towards the truth.

DISCUSSION

Dr. Rabinovitch:—There are two outstanding facts with regard to nephritis. One is—there can be no doubt—that by the application of such methods as Dr. Mason has demonstrated, a decided advance has been made in the study of the disease. The other is that the concensus of clinical opinion is that no great advance has been made in the treatment. How can we reconcile these facts? To treat any disease really successfully we must have some knowledge of the factors which produce, modify and control that disease. Just how much do we know of any of these factors with regard to nephritis? Our interpretations of the results of the chemical analysis of the blood in the so-called kidney function tests are based on the principle that when the kidney becomes insufficiently able to excrete any product of metabolism this product accumulates in the blood and the extent of this accumulation or the rate of its excretion is a measure of the degree of impairment in the kidney function.

If we really consider just what is happening I think we will find that these generalizations do not hold. What we are measuring by means of these tests is not necessarily kidney function alone. In the majority of cases we are attributing a certain defect in elimination of a substance to the kidney when we have more evidence to believe that the kidney has really little to do with the retention of that product. The kidney lesion appears to be a local manifestation associated with some general body disturbance, but because it is the more prominent and apparent clinical observation, we have classified it as a clinical entity and spent all our efforts in the study of that one phenomenon.

We attribute to the kidney an undue amount of discriminating power by saying that as the blood passes through it, it picks up different substances, a little of this and a little more of that. Is it not more reasonable to consider that what is excreted is brought to the kidney in such a physico-chemical state that it can be excreted. There is much more evidence in favour of the latter. For example, we say that albuminuria is due to an increased permeability of the kidney cells owing to their injury. If this is so, why will egg albumin, casein, haemoglobin and gelatin when introduced into the blood stream of a normal animal and therefore with normal kidneys, be excreted: Is it not rather that the albumin introduced exists in a different physical state than the albumin of the blood? Again we say that owing to a certain kidney lesion there is a salt and water retention. Why blame the kidney for this? We look upon the individual kidney cell as a living membrane. Do we know of any living membrane that is absolutely impermeable to water? Even a filter made of coagulated egg albumin will filter water and salt. If the living membrane has been injured in nephritis and owing to its injury such large particles as the protein molecule can pass through, why should not the insignificantly small salt molecule or ion pass through? We have striking examples to demonstrate this point. We have at present a patient in the hospital in whom, owing to a large amount of œdema, we have had an opportunity of studying the state of the salt in the blood and in the subcutaneous tissue fluids. These exist in two entirely different physical states and this difference is quite sufficient to account for the oedema, without attributing it to the inability on the part of the kidney to excrete salt.

A small kidney of an advanced chronic interstitial nephritis, weighing about 15 gms. instead of the normal 150 grams and resisting section like a piece of leather, and, according to the pathologist showing marked degeneration in its various tissues, will not only allow salt to pass through—for this type of nephritis is not associated with œdema—but will also allow water to pass through with such ease that the patient actually has a polyuria. We attribute to the kidney a glandular function. Comparing this organ with other glandular structures in the body, we find it not only differs fundamentally in origin, but also in function. It originates from mesoderm; other glands either originate from ecto-derm or endo-derm. It has the same origin as bone and connective tissue. In spite of the work of physiologists we cannot but believe that the excretion of urine is for the most part physical, since unlike the excretion of other glands, so much depends upon the blood pressure. For example, there are some glands which will not only keep on excreting at a lower pressure than that of the blood, but may have a greater internal pressure than the blood itself. The most striking example is that the difference in pressure between both sides of the capsule is just sufficient to overcome the osmotic pressure of the salts and colloids of the blood. The most we can say of our so-called kidney function tests to-day is that by chemical analysis of the blood and by analysis of the urine following the ingestion of substances we observe certain phenomena associated with slight and advanced lesions of the kidney. These are not necessarily caused by, but are associated with, the kidney lesions. This does not in any way alter their clinical value. The big factor that will influence excretion is probably the physico-chemical state of substances in the body fluids and the blood. A kidney lesion is a local manifestation of some general disturbance of the physico-chemical state of the body tissues. Unfortunately it is the most prominent phenomenon and all our efforts have been spent in studying that phenomenon.

With reference to the acidosis. Dr. Mason has emphasized an important point—that the acidosis in nephritis may be so severe as to be the actual cause of death. It is, however, difficult to accept the view as to the nature of this acidosis as suggested by Dr. Mason, and generally accepted to-day. We say that it is due to a retention of acids owing to the inability on the part of the kidney to eliminate the acids formed during normal metabolism. The amount of phosphorus Dr. Mason found in his case, when calculated in terms of free phosphoric acid, would not be nearly sufficient to account for the neutralization of the amount of base found as shown by his figures which represent the lowering of the CO_2 combining power of the blood. A study of the body excretion of acids in the normal individual and the nephritic by the method outlined by Leathes shows definitely that the nephritic kidney is not unable to excrete an acid urine. How then are we to explain the acidosis, which is definite? Benedict and Nash have calculated the actual amount of ammonia that could possibly pass through the kidney in twenty-four hours and the total amount is insufficient to explain that usually found in cases of acidosis. In other words, it appears to be a function of the kidney to produce ammonia. If we accept this view, the defective neutralization of acids in nephritis is more readily understood. It is not due to a retention of acids, but due to an inability on the part of the diseased kidney to produce sufficient ammonia for neutralization purposes.

Dr. Rhea:—Dr. Mason's very interesting paper would have shocked Richard Bright as well as those pathologists whose interest in kidney lesions centres about the gross and the microscopical picture. Dr. Mason has said nothing about classification of kidney lesions. He has dealt only with the functional capacity of the kidney cells. In this approach I think that he is working in the right direction because in dealing with the working capacity of a living tissue, he is able to make estimations not once but over long periods of time. We have for some time been interested in an attempt to correlate the gross and the microscopical lesions in a diseased kidney with the clinical signs and symptoms; up to the present time we have not been much encouraged. I know of no way that we can with assurance measure by means of the microscope delicate bio-chemical and physical potentialities. I cannot with assurance differentiate between injuries which temporarily interfere with function and those that will lead to death. Until we are able to do this the correlation between pathological findings and clinical symptoms will be unsatisfactory.

I have only comparatively recently had this impressed upon me. I was showing the kidneys from a patient, which had all the gross characters of a diffuse chronic nephritis and ventured the opinion that the patient had probably died in uremia. When the post mortem was complete we found frank lobar pneumonia, and when the records of the kidney function tests were looked up they were found to be normal. In this case though her kidneys were damaged she still had a sufficient amount left to permit their functioning.

After all, from the clinical view-point, it is not so much the extent of the damage that has been done, but to what degree the remaining tubules can function.

Work along the lines presented in Dr. Mason's paper not only helps to elucidate abnormal processes but brings hope and encouragement to the patient.

Dr. Martin:—One thing that strikes me about Dr. Mason's paper is that he has definitely shown that certain laboratory methods give well-defined results; and that exact limitation of the amount of protein and salt intake yields successful results in treatment. Careful dietetic measures controlled in the chemical laboratories are well worth while, and a great deal is to be said for systematic laboratory work.

In recent years our views in reference to many points in nephritis have considerably altered. For instance, we do not now lay so much stress upon the amount of albumin found in the urine as we formerly did; while on the other hand the importance of making repeated estimates of the specific gravity is being realized. This latter is often a fair indication of the progress of renal disease. Again, there is a widespread impression that a milk diet is the only proper diet in the acute and subacute forms of nephritis. Such a view is, of course, incorrect. There are many other articles of diet that may be used with greater advantage in this type of disease. There is a good deal of protein in a quart of milk, while many cereals contain only small quantities and can be used with impunity. It is recognized moreover, that the old-fashioned method of "flushing out" the kidneys may in certain forms of nephritis be pernicious therapeutics. It is only in a very limited variety of cases that flushing out is of value, *i.e.*, in cases in which there is retention of toxic substances which must be excreted in this way and do less harm when well diluted.

There is another point on which emphasis should be laid and that is the insidious origin of many cases of acute nephritis in connection with minor infections and the importance of prophylaxis. The best example of this is the renal injury which not infrequently follows cases of ordinary tonsillitis. How rarely do we consider it necessary to insist on the examination of the urine after convalescence? And yet I believe with Volhard, that a large percentage of cases of acute nephritis are due to infected throats.

In chronic nephritis, when we speak of a damaged kidney being beyond repair, that statement is only partly the truth. We must not forget that *what remains of normal structure is still able to function*, often for years. It is this portion, the undamaged portion of the kidney, that requires treatment and protection, and I heartily concur with Dr. Rhea in his appreciation of the capability in many cases of a damaged kidney to carry on. Functional tests help and guide us in attempting to intimate the amount of protection the affected organs need.

With reference to the prognosis of nephritis, we have a great deal yet to learn. Sometimes in acute nephritis when taken early and treated with every possible care, the disease continues its downward course until the end; and in the chronic cases, the serious conditions of hypertensive nephritis seem consistent with many years of life. One of my colleagues, who some fifteen years ago showed traces of albumin with blood cells and marked hypertension, is to-day in a prominent position as Professor of Bacteriology in the Orient, and enjoys about as good health now as he did before. In another case, a patient with marked hypertension has had persistent haematuria, frequently with claret coloured urine for two years, with all the accompanying evidences of chronic hypertensive nephritis, and yet she is enjoying a comfortable existence in spite of what would otherwise seem a very grave condition that could not last long. Surgical conditions of the kidney have been excluded by careful examinations.

Dr. Lewis:—The question raised by Dr. Mason's paper is how best to treat our cases of nephritis; to obtain the most satisfactory results it seems to me that certain tests which give an accurate, if empirical, knowledge of the state of the kidney function must be included in our management of the disorder. With the increased knowledge of the degree of functional damage, we will be able to carry out more efficient treatment, and often more comfortably from the patient's point of view.

The tests of function of any organ depend for their value on two points, their accuracy and their accessibility for every day use. Fortunately there are certain simple tests of kidney function which fulfil both the above requirements. We may study the concentrating and diluting power of the kidney by the simple means of measuring the amount and specific gravity of the different specimens voided during the day, in other words, the variability of the specific gravity. We also know that the healthy kidney tends to secrete a small volume of highly concentrated urine at night. The earliest signs of renal damage are nocturnal polyuria, and the loss of this concentrating and diluting power. As Dr. Mason has reiterated—"A damaged kidney cannot concentrate"; it is also true that the greater the degree of damage the greater will be the loss of concentrating power. These tests only require apparatus which is present in every doctor's office; they are therefore readily accessible to all.

A further series of tests require laboratory assistance. A defective urea excretion may be recognized by a rising value of the blood urea; this test is particularly valuable in those cases of cardio-renal disease which Dr. Gordon has mentioned. When the blood urea shows little tendency to rise in an apparently ill patient, we may assume that the symptoms are mainly due to cardiac failure, and direct our treatment towards the heart, with gratifying results; while if the blood urea is increased markedly, one thinks of severe renal damage, and give a correspondingly grave prognosis.

Dr. Mason:—Dr. Rabinovitch spoke of nephritis being a local manifestation of some general body disturbance. I do not think that he can be quite justified in saying this from what we know of the disease. Until more definite evidence is available I think we should consider nephritis as a kidney disease which may or may not be associated with diseased conditions in other tissues of the body.

As regards the cause of acidosis, it is quite true that the retained phosphates will not completely account for the lowered blood CO_2. Benedict's work on the formation of ammonia by the kidney seems very conclusive, and in nephritis I think we will find a lessened ability to form ammonia. This will undoubtedly bear upon the question of acidosis. In the future we will pay more attention to the physical status of salts in the blood, especially their balance between blood stream and tissue lymph. The method of determination of ionization of salts is not easy. We have got to cooperate more with physical chemists.

In reply to Dr. Finley I would like to speak of the value of functional tests in those cases where there is only a faint trace of albumin in the urine; through them we can obtain a good idea of the significance of the slight albuminuria.

TUMOURS OF THE KIDNEY

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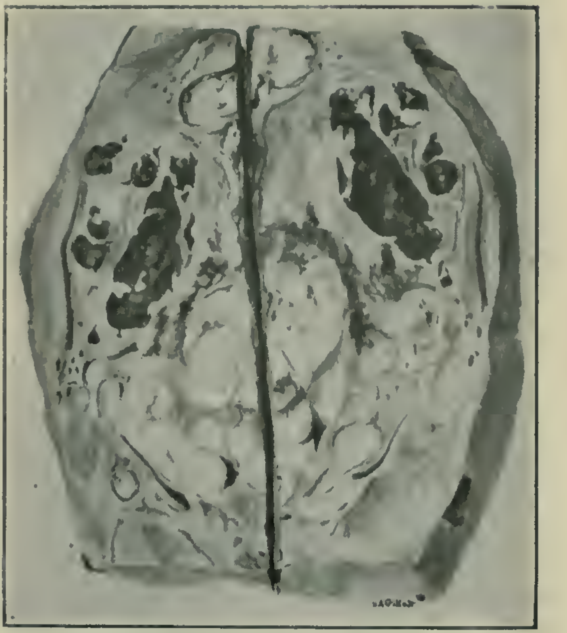
FROM a clinical point of view the classification of kidney tumours is not of great importance, as it is usually impossible to tell before operation whether the tumour is a hypernephroma, sarcoma, carcinoma or adenoma. The difficulty the surgeon encounters is in determining whether the condition is a tumour of the kidney or of the surrounding structures, or some other pathological lesion of the kidney, the symptoms of which simulate a tumour. Of all malignant tumours those of the kidney form the small percentage of about 0.05; and of all tumours of the kidney the hypernephroma constitutes about 65%.

Kidney tumours may arise in the parenchyma, the pelvis, or the capsule and are of connective or epithelial tissue origin. Occasionally, a mixed tumour arises and is teratomatous in nature. The hypernephroma is thought to arise from suprarenal rests in the kidney rather than from the kidney tissue. A rather convincing theory has been put forward that this tumour arises from the renal epithelium and that the various tumours described as of epithelial origin are only phases of the same growth. Sarcoma occurs more frequently than does carcinoma, and it is usually primary. Melanotic sarcoma, however, is always secondary. Carcinoma is usually secondary to a tumour in the testicle, stomach, uterus, mamma, pancreas, or of the other kidney.

Taking the hypernephroma as a type of renal tumour, we find that there is a great deal of variation in its mode and time of onset. Its average age incidence is fifty-five years, but it may occur in childhood, or, in advanced life. From the appearance of the first symptom to the recognition of the tumour, the time may be as short as a few weeks or it may extend as long as ten to twenty years. The average time is about three years. There may be only one sign, that of tumour, for many years.



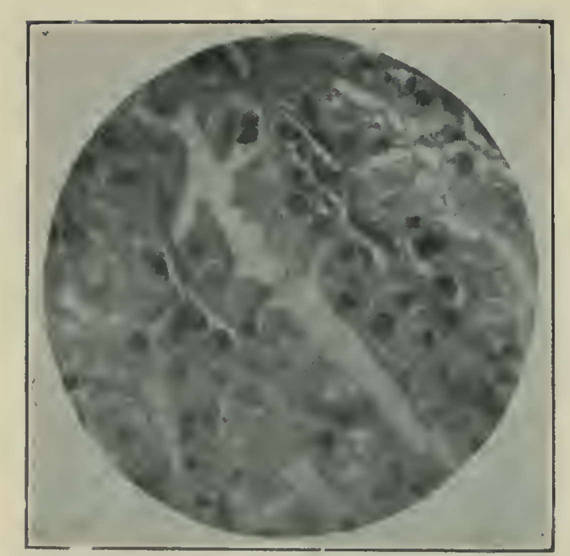
Entry number 1460—S/22/1361—NAME—G. A.

Gross specimen shows a kidney increased to about one and one-half times normal size by a mass at the upper pole. Section shows a mass in the upper pole of the kidney compressing and apparently infiltrating kidney substance. The mass is yellowish in color, cellular and friable and shows large areas of haemorrhage.

Microscopic section shows the tumor mass to be made up of large atypical epithelial cells, somewhat columnar in shape. The nucleus is placed at the base of the cell; the protoplasm is slightly eosinophilic but poorly staining. These cells are growing in cords and solid masses but in some areas show definite tubular arrangement.

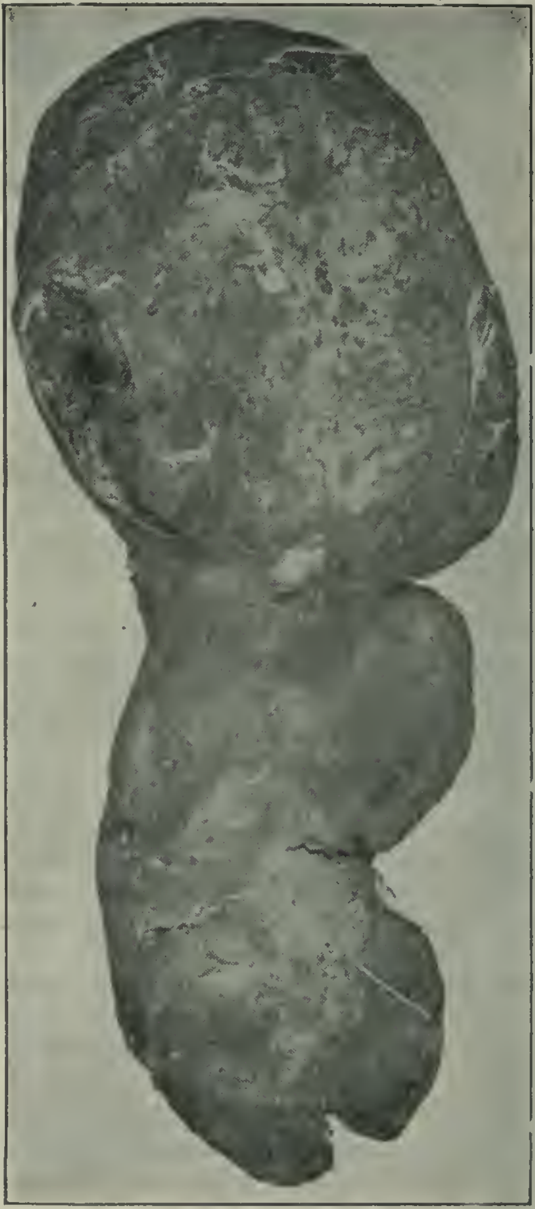
Diagnosis—Carcinoma.

Case No. 1.—George A., aet., 55: He enjoyed his normal good health until three weeks before operation when he had a severe attack of pain resembling renal colic, and an x-ray two weeks later showed two shadows which were thought to be stones. I was called out of town for the purpose of removing these stones. However, upon examination a large solid tumour could be readily made out connected with the left kidney. The mass which clearly had its origin in the kidney, and which was considered to be a hypernephroma, was removed and considered by Dr. Robinson to be a carcinoma. The patient made a good recovery. The interesting feature in this case was the total absence of symptoms until a very large tumour could be made out.



G. A.—Carcinoma. Notice Tubular Arrangement

Case No. 2.—I. M. L., aet. 64: Nothing important in the past history. He had been in his usual good health when quite by accident he felt an enlargement in the left side of his abdomen, and called in Dr. R. T. Noble, with whom I saw the patient. Upon examination a round, smooth, freely-movable tumour with a tympantic note over it, was easily palpable, and a diagnosis was made of tumour of the left kidney—probably a hypernephroma. Dr. J. C. McClelland, who catherized the ureters and made a phthalein functional test of each kidney, reported an excretion for the right kidney of 4% in thirty minutes, and for the left kidney 14% in thirty minutes, making the observation that the right catheter was blocked, giving rise to a mechanical error. Thorium introduced into the left renal pelvis showed it to be slightly enlarged in front of the last rib with the lower major calyx enlarged, but the minor calyces sharply defined. The left ureter was displaced by the mass towards the mid-line. Dr. McClelland reported, "That the kidney was above the mass felt in the flank and distinct from it. Both kidneys were functioning well, the defect in this test of the right side being apparently a mechanical one." He suggested a barium enema and a blood examination for possible splenic disease. In spite of this report one felt confident that the tumour was connected with the kidney and operation was undertaken on August 17th, 1921, when a left nephrectomy was performed. The pathological report is as follows: "Kidney slightly enlarged with whitish nodule near lower pole, the size of a hazel nut; capping the kidney is a mass the size of a large grapefruit, which on section contains yellowish coloured material with centre degenerated into a brownish



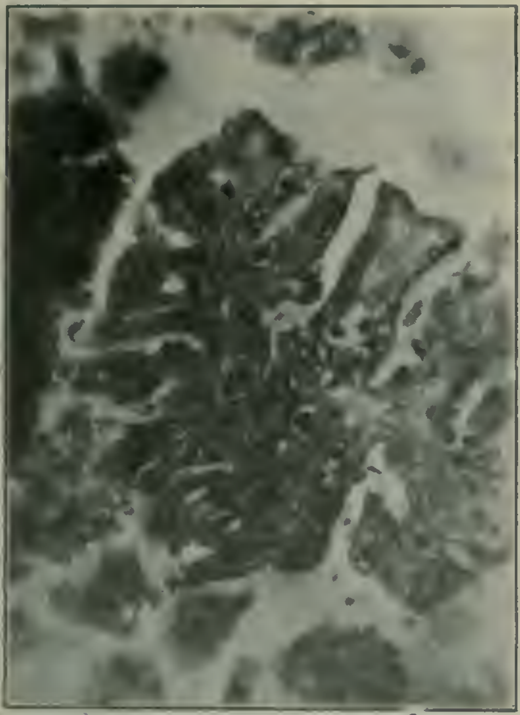
Entry number 921—S/22/1303—Name—I. M. L.

Gross specimen shews a kidney with a mass the size of a large orange, attached to the upper pole through an area of about two inches diameter. The mass is apparently completely encapsulated apart from its attachment to the kidney, is of spongy consistency, and blood vessels course over the surface. One small nodule, ½ inch in diameter, yellowish white in color, somewhat rough on the surface. protrudes through the capsule. On section the mass is yellowish and reddish brown in color and extremely friable. Towards the lower pole of the kidney there is a small nodule protruding on the surface, yellow in color, similar in character to the nodule seen in the growth.

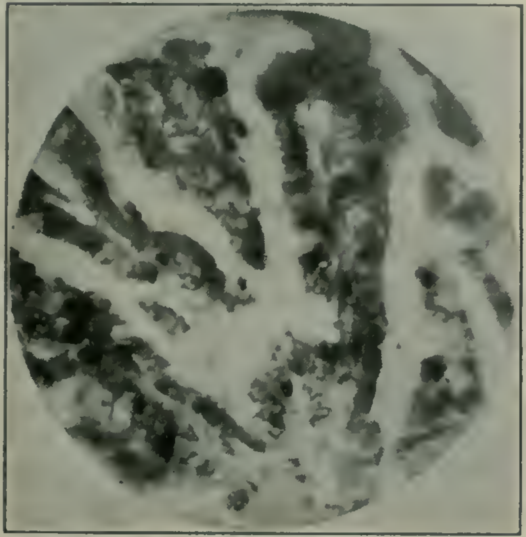
Microscopic section shows a papillomatous arrangement of atypical epithelial cells, cubical in shape with a neutrophilic protoplasm. The cells for the most part are well differentiated and lie in a single layer over a thin connective tissue core.

Diagnosis—Papillary Carcinoma.

coloured fluid. Slide shows irregular cords of cells, pale staining and contain fat." *Diagnosis*—Hypernephroma of kidney with secondary nodule in kidney.



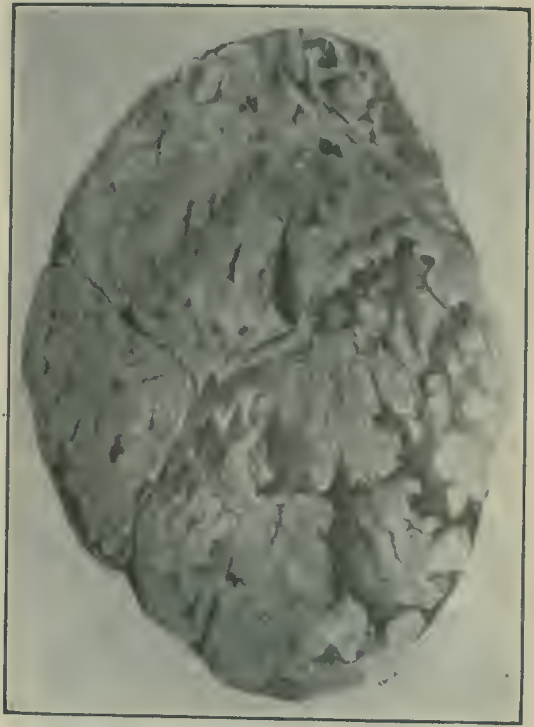
I. M. L.—Papillary Carcinoma.
Showing Papillary Arrangement.



I. M. L.—Papillary Carcinoma.
Showing Papillary Arrangement

A small sinus persisted, and in January last was dissected out, and sent to the pathologist who reported that it showed the large irregular masses, typical of a secondary growth from a hypernephroma. Since then he has had deep x-ray therapy, but it is too soon to say whether it will be beneficial or not.

Case No. 3.—Mr. W. S., aet 50: The patient had been complaining for a year of increasing general debility, a feeling of distention in the abdomen, flatulence and indigestion. He had lost about ten pounds in weight during the last year. It seemed a remarkable fact that a huge tumour, filling almost the entire abdomen, could have been present without the patient himself having observed it, and without being recognised by his family attendant, who had prescribed for him a number of times during the previous year. About two weeks prior to operation, examination revealed a very hard tumour the size of two adult heads, completely filling the left side and



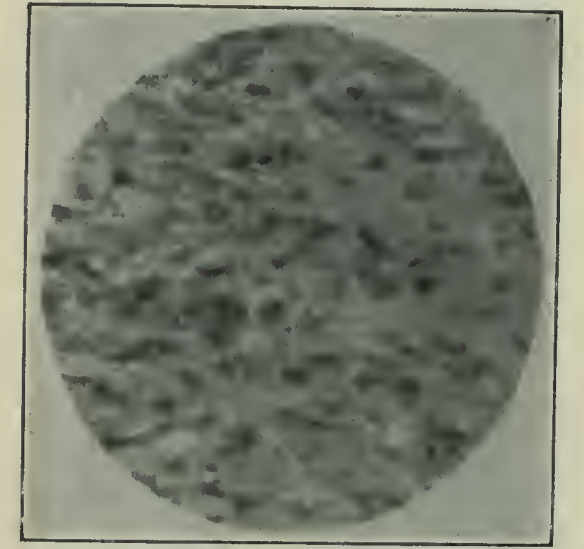
Entry number 926—S/21/1905—NAME—W. S.

Gross specimen is a mass about the size of a rugby football showing no evidence of kidney tissue. Surface is smooth and many vessels lie under an incomplete delicate capsule. The mass is yellowish in color and shows areas of haemorrhage varying in size. (Fresh section was soft, pulpy and on section showed semi-gelatinous looking material, marked by fibrous septa) Small areas of haemorrhage are to be seen throughout. The tissue is distinctly pulpy and friable.

Microscopic section shows large cells with very poorly staining protoplasm and small elongated nuclei. Outside the cells are fibrils. The cell resembles a myxoblast in size and shape, but some areas show differentiation into typical fibroblasts. There are some mitotic figures present. There are many poorly formed blood channels.

Diagnosis—Fibro Sarcoma.

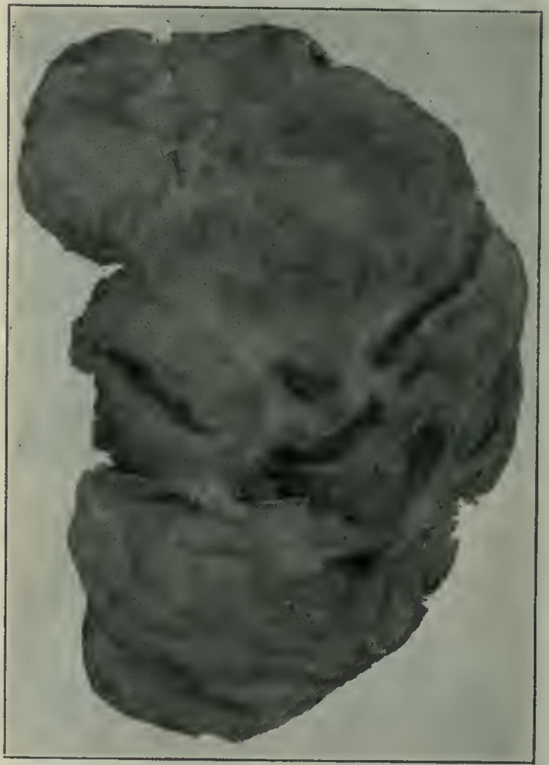
bulging over into the right half of the abdomen. A middle line incision was made from four inches above the umbilicus to one inch above the pubis. When the abdomen was opened the relief of tension in the soft rapidly-growing tumour caused it to rupture. Considerable haemorrhage followed, so that although one found the growth had invaded the caecum and would be exceedingly difficult to remove, there was no alternative as its quick removal was the only way to control the haemorrhage effectually. The small intestines were spread out over the tumour, and had to be lifted off during the isolation of the tumour. After very considerable difficulty the tumour and kidney were removed and the pedicle tied. It was considered unwise to resect the caecum and the softened area, about to perforate, was simply stitched over. He did very well for a week, when he was suddenly seized with severe abdominal pain followed by rigidity. Death occurred in twelve hours. The autopsy revealed a perforation at the seat of the involved caecum. Microscopic section showed it to be a sarcoma.



Entry number—926—S21/1905. Name—W. S.
Fibro Sarcoma. Oil Power.

Entry number—926—S21/1905, Name—W. S.
Fibro Sarcoma. High Power.

Case No. 4.—Mr. W. G. C., aet., 55: For a period of two years beginning ten years ago he had recurring attacks of chills and fever about every ten days. He was confined to bed on these occasions for one or two days. He had had occasional pain in the right side for some years. About three years ago he had a severe attack which was diagnosed "gall-stones". The patient was examined one year ago for life insurance and passed, as no mass could be felt in the abdomen



Entry number 1381.—S/22/1060—Name—W. G. C

Gross specimen, huge kidney 15″ long, 6″ wide and about 5″ deep, covered with a fibro-lipomatous tissue. The mass is fluctuant. Section shows remains of a dilated kidney wall with dilated calyces filled with a colloid material, which in some areas is distinctly purulent. One stone is embedded in the tissue in the region of the pelvis.

Microscopic section shows the wall to be made up of fibrous tissue infiltrated with lymphocytes and endothelial cel's. Large number of crystals can be seen surrounded by large foreign body giant cells.

Diagnosis—Pyonephrosis.

at that time. Blood pressure is now 190. A cystoscopic examination shows urine coming from left ureter, none from the right. On examination one could see and feel an enormous fluctuating tumour filling rather more than the right half of the abdomen. The colon was displaced inwards. The tumour was so large as to interfere with the movements of the diaphragm. A diagnosis of a pyonephrosis was made although nothing as large had ever been seen before. It was removed on May 8th, 1922, when it was found to consist of a sac, attached to which were remnants of kidney tissue filled with eight pints of puru'ent fluid. The cyst wall was in contact with the diaphragm and also in contact with the second and third portions of the duodenum. It was somewhat difficult of removal on account of firm adhesions to surrounding structures. At the end of the operation his blood pressure had fallen to 110, but he had very little shock and did exceedingly well until the sixth day when he developed pneumonia from which he seemed to be recovering nicely when seven days later, i.e., the thirteenth day after operation he suddenly passed away from cardiac failure.

W. G. C.—Pyonephrosis.
Kidney Opened.

Case No. 5.—Mr. E. R., aet. 25: This patient had no symptoms whatever until three weeks previous to operation when he was taken with pain in the left side, and called his physician, who, on examination, discovered a tumour. It was about the size of a baby's head, occupying the epigastric and left hypochondriac regions, was elastic, smooth, rounded, and moved with respiration. A diagnosis of hydronephrosis was made, and confirmed at operation when a nephrectomy was done, only a slight amount of kidney parenchyma being left. He made a good recovery.

In considering the diagnosis of renal tumours, the following symptoms are of chief importance: (1) *Haematuria;* (2) *Tumour;* (3) *Pain.*

(1) HAEMATURIA

This symptom characterizing a renal tumour is spontaneous; it is intermittent over long or short periods. As it usually comes from the tumour, it may be regarded as an over-flow and unaccompanied by pain or fever, or displaying these latter symptoms only if clotting occurs subsequently. A milder form of haematuria, which is of a low degree and more constant may occur as the result of the tumour pressing on the surrounding renal tissue.

The blood found in the urine is traced up to the kidney by means of the cystoscope and ureteral catheter. While this is done, the ureteral orifice is examined to find any dilatation of the superficial blood vessels which may occur in tumour. It is extremely important to resort to the cystoscope while the haematuria is in progress, in order to determine from which kidney it comes. If this is not done, a long time may be lost in making a diagnosis. Blood coming from the kidney may be due to many conditions besides tumour. It may be the only manifestation of essential haematuria; it is frequently found in nephrolithiasis; it may mark the early stages of tuberculosis of the kidney; a renal infarction or infection may display this symptom. At times a bleeding hydronephrosis simulates very closely a renal neoplasm. The activity of parasites such as the Filaria or Bilharzia may produce the symptom; and lastly, it may occasionally be found in movable kidney when kinking causes a temporary obstruction.

In Essential Haematuria. Almost invariably the bleeding is the only symptom. The diagnosis of renal tumour should never be made on the evidence of bleeding alone. When symptomless haematuria occurs in the presence of normal renal function and the side affected is determined, nephrotomy may be a necessary procedure to arrive at a diagnosis.

In Nephrolithiasis. The urine shows pus as well as blood, and the subjective symptoms are characteristic. The x-ray may confirm the diagnosis.

In Tuberculosis. Bleeding is a very infrequent symptom. Pus and the tubercle bacillus may be isolated in the urine. The constitutional symptoms and findings of tuberculosis are also present.

In Movable Kidney. Infrequently the sudden intrarenal tension accompanying the kinking with obstruction may give rise to bleeding. The acute symptoms of Dietl's crisis should be recognised.

In Renal Infarction. There may be symptoms of endocarditis and the bleeding is a symptom of an acute illness which commences with a rigor followed by fever.

In Pyelitis, Pyelonephritis and Pyonephrosis. There should be no difficulty in recognising these conditions of ascending or haematogenous infections.

In Haematonephrosis. When bleeding occurs in a hydronephrosis the subjective symptoms closely resemble a renal tumour. The finding of a large amount of residual bloody urine in the renal pelvis and a pyelogram make the diagnosis clear.

(2) TUMOUR

By far the most important point in the diagnosis of renal tumour is the determination of the tumour itself by palpation. This is rendered difficult by a rotund abdomen and by a high position of the tumour. The suspicion of tumour is strengthened when coincident circulatory disturbances are manifested by an irreducible varicocele, by haemorrhoids, by dilatation of the superficial blood-vessels of the bladder, or scrotum, etc. Such pressure symptoms as a partial intestinal obstruction or a jaundice may tend to obscure the diagnosis so that one must bear in mind the anatomical relations of each kidney in order to determine what pressure symptoms might occur from a high tumour on one or the other side. These symptoms may be absent or present to such a mild degree as to be disregarded by the patient and he may not present himself until the tumour has attained a very great size.

The tumour is firm and irregularly round. It tends to become more and more fixed, moving little, if any, with respiration. The tumour is best felt projecting from beneath the last rib and filling out the space between it and the iliac fossa, and, with one hand behind and the other in front, it may be pushed back and forth. Inflation of the colon with air may reveal this structure pushed inward above the tumour, and in this position the condition may be mistaken for a tumour of the spleen. Sometimes a renal tumour assumes a median position, the colon being external, and may be high enough in the abdomen to simulate a pancreatic cyst. When the tumour is on the right side it may be mistaken for a distended gall-bladder or a tumour of the liver. One must bear in mind the possibility of a retroperitoneal tumour or of enlarged lymphatic glands found in Hodgkin's disease. A tumour in a displaced kidney, or one invading the iliac fossa may bear a resemblance to an ovarian cyst. Finally, a kidney tumour must be distinguished from a cystic kidney or hydronephrosis. In renal tumour the examination of the urinary tract may reveal the ureter pushed towards the median line, or abnormally out in the flank or depressed along with the pelvis. A pyelogram may show a distortion of the pelvis; one or more of the calyces may be so deformed as to give a spider-like appearance; or the pelvis may be irregularly compressed or dilated without any evidence of stone. An x-ray of the kidney itself may show a slight shadow which may be taken for a calculus as in Case 1. The x-ray examination of the oxygen-inflated peritoneal cavity may prove helpful in making a diagnosis.

In Tumour of the Spleen. The tumour dullness is higher in the left flank than a kidney tumour and when it projects beyond the costal margin its dentated margin is diagnostic. It moves with each respiration. As it descends into the abdomen it is in contact with the abdominal wall, hence there will be dullness over it, and a tympanitic note in the left flank. Whereas in renal tumour there will be dullness in the flank and a tympanitic note in front. There are blood changes and none of the urinary symptoms of renal tumour.

Distended Gall-bladder. This should present no difficulty as this is an acute condition with symptoms referable to the digestive tract and no urinary symptoms or findings. The tumour does not invade the flank and is close beneath the abdominal wall and tender on palpation.

Pancreatic cyst. There is usually a history of former injury. The tumour is fluctuating, and the regular spherical form which it assumes as it insinuates itself between the abdominal organs is helpful in distinguishing it from a solid tumour. A pancreatic cyst most frequently comes forward to the abdominal wall between the stomach and transverse colon, where it will be recognised as a dull tumour between the tympanitic note of the distended stomach above and the colon below, following inflation of the two latter. There is no haematuria and no cystoscopic or pyelographic evidence of renal tumour. The symptoms of pancreatic insufficiency may be present.

Ovarian cyst. This is determined by an accurate pelvic examination along with an absence of urinary findings.

Hydronephrosis. The tumour usually varies in size from time to time according to the temporary relief of the obstruction. It is usually fluctuating. When the ureteral catheter is passed, it encounters some obstruction in the urinary tract. If this is slight, and the catheter passes, there is a copious flow of urine, where previously there was none. When the ureteral catheter has passed the obstruction, a pyelogram shows the distended pelvis. It may, however, be impossible to pass the obstruction as occurred in the case which I am reporting to-day.

Cystic Kidney. Polycystic disease most frequently affects both kidneys. There is renal insufficiency, high blood pressure, and low specific gravity of the urine. The phthalein and the blood urea tests, which are respectively low and high, are helpful in ruling out tumour. The simple cyst which rarely occurs cannot be definitely diagnosed from a tumour. It is usually found in the lower pole, seldom becomes larger than a grape fruit and is, as a rule, symptomless.

(3) PAIN

The pain is of three types. (a) *Local pain* due to intrarenal tension. It may be felt in the upper abdomen or in the back. It is more or less constant and usually dull. (b) *Referred pain* from pressure on surrounding nerve trunks. It is neuralgic in character and may radiate down towards the groin. (c) *Colicky pain* from sudden haemorrhage or from blood clots or pieces of tumour tissue in the urinary tract, may assume all proportions up to the simulation of a true renal colic due to stones.

The character of the pain in renal neoplasm is described as having so many variations, and the fact that it is sometimes absent, has resulted in text-book description of this pain which are not of much diagnostic value. To make this symptom of any value it must be traced throughout the whole duration of the complaint and its various manifestations linked up with the progress of the disease as manifested by other symptoms and signs. If this could be done in those cases exhibiting pain it would probably be found that the many described variations in the character of the pain were really only phases of the symptom as observed at different stages of the growth of the tumour.

A sickening pain of short duration in the back or loin is inflammatory in origin and is not the kind of pain which characterizes a tumour. The pain of a tumour is dull and of long duration. It is a pain which the patient does not guard. He tries to get away from it, and in this respect it resembles pain of a colicky nature rather than that of an inflammatory condition. The dull pain of long duration, which unlike that of stone, is independent of motion, with exacerbations of acute colicky pain or sharp pain tending to radiate down along the ureter, and usually accompanied by haematuria, is strongly in favour of renal neoplasm.

Again, when a persistent pain in the region of the kidney gradually assumes a neuralgic character radiating into the abdomen or down towards the groin, it is frequently significant of an increasing growth in the kidney pressing on surrounding nerve trunks.

Traumatic Hydronephrosis.—A. Sträuli records in detail the case of a man, aged twenty-five, whose hydronephrosis was traced to a fall on his back. The author's discussion of the accident insurance aspect of such cases shows how difficult it is to trace the genesis of a hydronephrosis to an accident, and though about fifty cases of traumatic hydronephrosis have been recorded, all do not bear close scrutiny. In distinguishing between traumatic and non-traumatic hydronephrosis the three following points should be considered: (1) absence or presence of renal symptoms before the accident; (2) absence or presence of other causes of hydronephrosis, such as congenital anomalies of the urinary system, disease of the uterine appendages, chronic perityphlitis and peritonitis, tumours of the abdomen and bladder, and gonorrhoeal stricture of the urethra; (3) proof that the accident directly affected the kidney or led to changes which could be regarded as responsible for obstruction to the flow of urine.—*Brit. Med. Jour.*, December 16th, 1922.

TUBERCULOSIS OF THE INTESTINE—THE ULCERATIVE FORM, AS A PHASE OF PULMONARY TUBERCULOSIS*

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Ninette, Man.

IN the past five years a series of masterly papers and addresses by Archibald, Pirie, Brown and Sampson, and Carman, with a considerable literature besides, has brought this phase of tuberculosis, clearly, almost dramatically, before both physicians and surgeons. I venture to bring the subject again before you to discuss the question of how close the association is between the disease manifesting itself in the lung and in the intestine.

Looking backward over what experience we each may have had in the treatment of tuberculous patients; considering the frequency, the early appearance, and the persistence of intestinal symptoms; considering the old dicta that the road to recovery lies through the stomach; that the best friend of the consumptive is a good digestion; that poor eaters do badly; that digestion is the key-stone of the prognostic arch; that a flux of the bowels tends to a fatal outcome, should we not be on the outlook for early and definite complications in the intestinal tract? Among eighty-nine unselected cases of pulmonary tuberculosis, many of them early, Lawrason Brown found four with definite enteritis, roughly four per cent., and two suspected, roughly two per cent. In the Manitoba Sanatorium we deal with patients of farther advanced types than Brown's. Of five hundred and sixty who were definitely tuberculous in the period under consideration—a little over two years—only six per cent. were classed, as to their pulmonary disease, as incipient; sixteen per cent. as moderately advanced, and seventy-eight per cent. as far advanced. Of the far advanced, one third, that is twenty-three per cent. of all admitted, were sub-classed as "apparently hopeless".

All five hundred and sixty patients were questioned as to intestinal symptoms, and fully examined; a barium investigation was made on suspicion only. Positive symptoms and also positive barium signs were required for a definite diagnosis. In this body of patients, then, out of five hundred and sixty, two hundred and nine, or about thirty-seven per cent. were definitely suspected of intestinal disease. Of these, sixty-three, or *thirty per cent.* were considered fairly negative, forty-three, or *twenty per cent.* doubtful or not proven, and one hundred and three, or *fifty per cent.* of those suspected, were regarded as positive. Of the five hundred and fifty, then, *thirty-seven per cent.* were suspected of intestinal tuberculosis, and *eighteen per cent.* diagnosed as having definite intestinal tuberculosis.

Our impression is that in this series we have been altogether too conservative; that we have demanded too much evidence, especially too definite barium signs, before making a diagnosis; that the incidence of intestinal disease is really higher in cases of this type than our percentages show; that most of our suspected cases should be considered positive, and that full investigation of the intestinal tract in patients having pulmonary tuberculosis should be a routine. A series of post mortem examinations by several observers have shown definite tuberculous intestinal ulceration in from seventy-five to ninety per cent. of the bodies of those who have died of pulmonary tuberculosis. Such a high percentage as this at the time of death suggests that enteritis may have given the "knock-out blow."

In the ordinary run of post mortem material, healed intestinal lesions are found, even in the bodies of children. Heller and Wagner found twenty-eight foci, evidently primary, and healed, in six hundred autopsies. Opie states that in twenty-five per cent. of all autopsies on British soldiers nodes showing healed ulcers of the bowel were found. Surgeons also find such lesions, healed and unhealed, where there had been no complaint of symptoms. Many such foci must surely be primary. We have, then, clinical and pathological evidence of a frequent and close, late and even early association of intestinal with pulmonary tuberculosis. It may be that the pulmonary lesions have too much dominated our picture. Intestinal ulceration has been in the past regarded as a complication only, scarcely looked for or expected until it thrust itself upon our attention. Perhaps we should raise the complication from a subordinate place to an equal or almost equal partnership in crime. Why must it be always pulmonary tuberculosis complicated by intestinal tuberculosis? May it not sometimes be rather intestinal tuberculosis complicated by disease in the lungs, "intestinal and pulmonary" rather than "pulmonary and intestinal", the intestinal disease the earlier of the two, the senior partner? We know it is very often in the late stages the dominant partner. Perhaps the disease entered through the intestine and passed to the lungs and did not enter at the lungs and pass to the intestine.

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*Read at the Meeting of the Canadian Medical Association, Winnipeg, June, 1922.

Diagnosis.—What of the diagnosis? An ounce of early diagnosis is worth many pounds of attempted cure. A diagnosis well made is treatment well begun. We all know the old text book symptoms of disease in the intestinal tract, anorexia, even nausea, tenderness and pain, diarrhoea and emaciation. To demand these for the diagnosis of intestinal tuberculosis is like demanding for the diagnosis of pulmonary tuberculosis bubbling and cavernous rales, night sweats and a hectic flush. They are late and prognostic, not early and diagnostic signs. The diagnosis should be made, must be made, long before these appear. Lawrason Brown mentions as early symptoms extreme nervousness, constipation, slight dyspepsia, a feeling of discomfort after meals, gas, failure to gain weight under suitable conditions; a general "not doing well" for which no other special reason can be found. He considers neither pain nor diarrhoea to be really early symptoms. Archibald thinks that any derangement of digestion or of appetite, especially in one who has pulmonary disease, and any pain should always be looked on as possibly due to tuberculosis of the bowels. I am inclined to consider impaired appetite in one who has pulmonary tuberculosis as the most suggestive early symptom. Perhaps one should include any abnormality of appetite. In one of our patients the usual symptoms of acute intestinal disease found at operation to be very wide-spread, were preceded by months of ravenous appetite. The nervous organization seems much more profoundly affected by intestinal lesions than by pulmonary, and mental depression is common, although seldom met with in pulmonary disease. Archibald considers typical pains as conclusive in the diagnosis. "When the patient complains of a pain felt in the mid or lower abdomen, coming on at regular intervals during the day, but chiefly from the late forenoon or afternoon on, transient often, crampy or stabbing, suggesting gas pains, aggravated by food and relieved by fasting, felt only during part of the day, but persisting from day to day, then one must be very suspicious of tuberculosis. When, in addition, he complains of loss of appetite, of real distaste for food; when he has nausea at times; when he gives up one article of food after another; when he develops a slight fever which is not attributable to his lung condition, and if this persists over three or four weeks, then one may be almost sure of the diagnosis." The later symptoms, which are unfortunately too well known to need mention, may vary according to the localization of the ulcers and other elements and phases.

Any part of the bowel, from the stomach to the anus, may be affected, the order of frequency being apparently the ileocecal region, the ascending colon, jejunum, descending colon, sigmoid and rectum. The ileocecal valve and the cæcum would seem to be the storm centre. There, Carman says, the ulcers are confluent. Constipation seems characteristic of lesions of the small and diarrhoea of those of the large bowel.

X-ray in Diagnosis.—But if the diagnosis is to be made early, before any but vague and slight symptoms have appeared, indeed before definite complaint has been made, the opaque meal and enema must be given at least an equal share with clinical investigation. In our series, the meal was given as a routine, the enema as a secondary procedure, chiefly when in doubt. I am not sure that this order would be approved by all workers. The diseased bowel has patches of ulcerated inner surface; its walls are infiltrated and hypertrophied; and there are constrictions and adhesions which narrow its lumen, and make kinks in its course. Naturally, marked abnormalities in the progress of the meal, and in the filling of the bowel by meal and enema, result. Spasm may cause delay, as is, perhaps, a frequent condition when the disease is in the upper bowel: local or general hypermotility may supervene, especially when the disease is in the lower bowel. Every type of pathology in the bowel makes for defective filling. The meal or enema does not show the full expansion, the well-rounded haustrations or the smooth outlines of the normal bowel. But there's the rub. What is the normal bowel? What is a normal nose, or chin, or face, or figure, and what variations in filling can still be considered a normal bowel outline? How few and fine barium variations should be classed as diagnostic, or how slight symptoms, or how small a total of signs and symptoms? Those who, like Carman, see unselected cases, allow great diagnostic weight, in intestinal conditions, to the presence of pulmonary tuberculosis. We, who see selected series, all having pulmonary lesions, perhaps do not allow enough weight in diagnosis for tuberculosis already present in the lungs. Barium is of the greatest help in outlining the large bowel, of very little value in diagnosis of small bowel lesions. If tuberculous ulceration of the bowel has recognizable early stages, if by clinical observation and study, by opaque meals and enemata, and perhaps by other methods yet to be devised we can learn to diagnose at an early stage, and institute treatment at any early stage, we should expect to better the prognosis not only of this one phase of the disease but of the whole general disease—tuberculosis—as well. Late treatment can only be palliative; early treatment can aim to cure.

Treatment of tuberculous ulceration of the bowel, which has in the past been chiefly for the relief of symptoms, has included general good conditions, diet, drugs, and enemata. To these may now be added light therapy, including perhaps, the x-rays, and surgery. The general good conditions, rest, regulation of energy expenditure, fresh air and the various other phases of the routine of a tuberculous patient, become doubly insistent, when the least or earliest sign or even suspicion of intestinal disease arises. Dietetic considerations are rather negative than positive, the choosing of food not irritating or gas producing.

Drugs of almost every kind have been used, antiseptics, sedatives, astringents, opiates, and even lubricants, for the relief of symptoms rather than for the cure of the disease.

Light Therapy.—The oldest of therapeutic agents has become the most modern also. There is something not new under the sun, light. Artificial light can be applied easier than the sun's rays, and with less risk, more regularly and to patients more ill. The Alpine Lamp seems to give results in intestinal tuberculosis. There is no doubt as to the enthusiastic belief of the patients in its efficacy—and even that is of value.

Our routine, after gradual habituation to the lamp, is forty-eight minutes exposure, twenty-four back and twenty-four front, the lamp at twenty-four inches, every other day, in alternative periods of three weeks. Brown pushes the lamp beyond this limit and exposes to x-rays as well. Of the forty-three doubtful cases in our series, fourteen were unsuitable for lamp treatment on account of progressive lung lesions, and eight for other reasons. Of the twenty-one who had lamp treatment, in sixteen the intestinal symptoms were definitely improved and in five not improved.

Of the one hundred and three positive cases, thirty-nine were hopelessly ill—too ill to be subjected to lamp treatment—and eight have been on this treatment for but a short time Of the fifty-six positive cases and twenty-one doubtful cases, seventy-seven in all, who had lamp treatment long enough to give some idea of results, an analysis may be made. Of seventeen with gross active lung disease and acute active intestinal disease, one improved temporarily, two more permanently, (one operated upon also) fourteen did not improve. Of the ten with gross active pulmonary tuberculosis and less active intestinal disease two improved temporarily, eight did not improve. Of three who had pulmonary disease less gross and active, but whose intestinal disease was active, all improved, two after operation. Of the remaining forty-seven whose pulmonary disease was not so gross or active and intestinal disease not more than moderately active, all but five made what is apparently permanent improvement, or recovery, and one was improved temporarily; only four made no improvement.

Of the whole seventy-seven, treated by lamp for a considerable time, many of them with gross pulmonary and intestinal lesions, two-thirds have shown improvement. On the other hand, results of operation are, to say the least, not altogether encouraging, even considering the newness of this method, and that it will likely improve, and that lamp results are so recent as to be scarcely comparable. With these considerations in view Brown reports sixteen cases operated upon of whom three are living and thirteen dead; thirty treated by lamp, of whom, so far, twenty-five are living and five dead; and twenty-nine who had no definite treatment beyond general routine of whom ten are living and nineteen dead. Of seven patients we have sent for operation one favourable and one very unfavourable and indeed unsuitable died within a few days of operation. Two had unilateral exclusion for extensive disease, and are apparently recovering or recovered. Two had disease so wide-spread above and below the valve that operation was decided against. A third with similar findings is making a good recovery after removal of a troublesome looking appendix.

Surgery.—Surgical treatment of some forms of intestinal tuberculosis is not new. Hypertrophic conditions, stricture of the small bowel due to ulceration and tuberculous disease in the appendix have long been submitted to operation, but resection or exclusion of an ulcer-studded segment of a tuberculous bowel in order, by putting it at rest, to promote healing, is a comparatively new application of surgery. The choice of operation is influenced less, perhaps, by the state of the bowel than by the condition of the patient. Archibald considers the more complete operations preferable, the choice being, excision, then exclusion, bilateral or unilateral. When these are not possible, opening the large bowel and forming an artificial anus, or even the removal of a troublesome appendix, may be palliative, and sometimes of more permanent benefit. Widespread active or progressive lung disease is a contra-indication to operation. Archibald considers that the outcome varies directly with the condition of the lung lesion. Wide involvement of the small bowel, which unfortunately cannot be determined at all definitely before operation, is also a contra-indication.

Among the various kinds of lesions Archibald considers hypertrophy and stricture to be evidence of general resistance of the body to tuberculosis, and ulceration to be associated with lack of resistance. Operation would, of course, be much more likely to be successful in the former than in the latter type of case. Long duration of symptoms, especially of discomfort and distress with failure to respond to three months or six months lamp treatment should raise the question of operation. In such a case, Brown says, the lamp is of little value, though the lamp and the x-ray may do better. In acutely progressive intestinal disease, even if wide-spread, the chance of operation should be taken if the lung condition is not too active. No other treatment will overtake the disease. It is surgery or nothing.

Over against the shock of operation, there are the compensating advantages of eliminating an active focus of disease; of clearing up the diarrhoea, and of the relief of pain. Operation may be indicated even for the relief of symptoms. The surgeon asks that the intestinal disease to be suitable for operation shall be early, localized and limited; that the small bowel shall not be too widely involved, and especially that the lung lesions shall be limited in extent and activity, and the general condition fairly good.

But we can rarely give the surgeon all he asks. We are privileged to see the earlier stages of disease in very few of our patients. Intestinal disease when we see it first is in most cases a part of a distressful far-advanced long-neglected general condition for which ignorance both in and out of our profession are responsible. Surgery has little to offer if it can help only an ideal early case; if it can pluck no other brands from the burning.

Treatment Eclectic.—The choice of treatment must be eclectic. The big, obtrusive, difficult question is as to the place of surgery; the great decision, to operate or not to operate. This question a physician cannot presume to finally decide. This much can be said, that operation, however successful, is but an incident in a long patient treatment. To it all other useful forms of treatment must be added. Of these so far as we can see at present the quartz lamp—perhaps with the x-rays added—is altogether the most promising.

Though still largely empirical treatment its results apparently are such that it should be pushed perseveringly in all definite or even suspected cases of intestinal tuberculosis, and should not be denied, where it can be given, to even the far advanced and apparently hopeless.

Summary.—We may conclude, then, that intestinal ulceration, tuberculous in origin, is found in a fairly wide percentage of cases of pulmonary tuberculosis. It is likely implanted early, perhaps earlier than the lung lesion. It is almost universally present in the late stages of pulmonary disease and hastens, or perhaps causes, death.

It is treatable and even curable in its early stages. Early diagnosis, especially of disease in the small bowel, is not yet satisfactory, but much can be done by careful study of symptoms and the opaque meal and enema. Surgical treatment is suitable in some cases, but is of limited applicability. The most promising treatment at present would seem to be the ultra violet ray given by the quartz lamp, with perhaps the x-rays as well.

CANCER OF THE STOMACH*

F. N. G. Starr, C.B.E., M.B., F.A.C.S.

Toronto

DOUBTLESS more than one person present has said "Why in the world didn't he choose something of a more general interest!" My reason for selecting cancer of the stomach as a subject for discussion is that unfortunately most cases are not suspected, much less recognised until they are hopeless. If we doctors become fully alive to a sense of our responsibility to our patient many lives may be saved, and many more prolonged indefinitely by an early suspicion and a careful diagnosis.

Bear this in mind that the nerve supply of the stomach comes from the two pneumogastrics and from the coeliac plexus of the sympathetic. These nerves *per se* are not sensory nerves but the sympathetic fibres intercommunicate with the dorsal nerves and through these one may derive referred sensation or even pain. Pain is not and cannot be an early symptom of cancer; hence don't wait for pain. Pain is a late symptom and suggests involvement of the abdominal parieties, excepting pain referred through fibres of the sympathetic, as mentioned above.

Remember this too, that the digestion, so far as the stomach is concerned, depends partly upon the chemical action of the secretions and partly upon the mechanical mixing of the contents. Given a meal the stomach at once pours out its secretion, consisting principally of pepsin and HCl. This often is encouraged by a well-balanced meal, beginning with an appetizer, or a hors d'oeuvre, and secretion begins even before the food enters the stomach. In a few minutes after the entrance of food peristalsis begins, so that essentially it is but a mixing basin. Little absorption takes place in the stomach except of water and, in pre-prohibition days, of alcohol. Anything that causes interference with the secretion or with the mixer will sooner or later cause symptoms.

To us as doctors falls the duty of interpreting these symptoms, making at the same time a close study of any physical findings that may be present. A great essential in the investigation of a case is a carefully taken history. Sometimes when time permits I like to get Dr. Shier to take a patient's history, then get Dr. Graham, and then take one myself; then get together and thrash the thing out among ourselves with the patient present to correct any improper interpretation of his statements.

When a patient comes complaining of distress or discomfort in the epigastric region which, when the history is carefully analyzed, one finds comes on at any and all times with eructations of gas and often food, which bears no relationship to the quality or even the quantity of food taken, or when the patient complains that he has lost 'pep'—he may have begun to lose weight because of his failing appetite—investigate that patient until you can absolutely eliminate cancer of the stomach, and you will save yourself many heartburnings.

Don't, I beseech you, hide behind such diagnoses as indigestion, torpid liver, and what not. Such terms are merely excuses for ignorance or laziness. Don't fiddle with *treatment* until you are sure of your diagnosis.

Palpate the abdomen carefully with the knees flexed for a possible tumour. Note the various skin reflexes. Examine the stomach contents for the presence or absence of HCl. Commonly it is absent in cancer, but it may be present even in advanced cases. Note the presence of food particles and find out when such were eaten. To demonstrate pyloric obstruction the patient may be given a few raisins and the stomach washed out ten or twelve hours later, to find if they have remained in the stomach.

When you have exhausted all the means at your disposal and are still not sure, send your patient to a competent gastro-intestinal x-ray expert, for this is a most satisfactory method of arriving at a conclusion, providing your x-ray man *is* an expert.

If the findings all lead to cancer or even to a suspicion of cancer, then the patient must be taken into your confidence and told frankly what you suspect. Don't beat about the bush and talk learnedly of "growths", talk about "cancer". It is not a nice subject of conversation but I've never yet seen a patient who was not grateful for the confidence placed in him. Suppose he does get sore and go off to someone else or to the Christian Science healer, or to the osteopath, your conscience is clear and he is the worse off for not following your advice.

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*Read at Ontario County Medical Association, Oct. 1922.

It is, however, not necessary to paint too gloomy a picture for the condition may not be hopeless if you have made your diagnosis early. I am glad to say that we are improving with the years as the following personal experience will show: In the period of five years from 1907 to 1911 (inclusive) I operated on eight cases of cancer of the stomach. In only four was it possible even to do a gastro-enterostomy, all being inoperable so far as radical measures were concerned.

From 1912 to 1916 (inclusive)—29 cases:
    In 13, or 45%, it was possible to do a palliative gastro-enterostomy.
    In an additional 5, or 17%, it was possible to do a resection of the stomach.
Of these
    1 died of pneumonia 3 years later,
    2 are still living,
    2 cannot be traced; hence probably dead.
From 1917 to 1921 (inclusive)—39 cases:
    In 12 a palliative gastro-enterostomy could be done.
    In 13, or 33%, a radical operation was done.
Of these
    1 died of delayed shock 2 days after operation.
    1 died of acute dilatation 10 days after operation.
    1 died of pneumonia 11 days after operation.
    1 died of secondaries in the liver 2 years after operation.
    1 is now dying of secondaries in the retroperitoneal glands.
    8 are living and well.

Of these seventy-five cases let me say that the later the diagnosis the more hazardous the risk of even opening the abdomen. In all these cancer cases there is an "unknown quantity" to be dealt with. In many of the cases if exploration has to be done to determine the operability, it is well to do it under local anaesthetic with the assistance of analgesic gas.

I think a study of that list will show that as the years progressed there was a decided improvement in the diagnosis as demonstrated by the number in which resection was possible. There will always be cases, however, that never consult a doctor until the case is hopeless.

Having made the condition as clear to the patient's mind as it is possible, and the patient having decided that he will undertake the risks coincident therewith, a surgeon must be chosen who is known to be competent to deal with the case as the pathology found demands. It is not fair to the patient or to another surgeon to open a man, verify the diagnosis, and then turn him over to someone else to complete the job that might have been done at one sitting.

Having an "uncertain quantity" in all these cases to deal with, the patient should be in bed in hospital for several days prior to operation. He should *not* be purged, but should be fed with as much nourishing food as he may be able to assimilate. He should get a 5% sodium bicarbonate solution with 10% glucose by Murphy drip for at least two days prior to operation. If there has been much previous vomiting with its associated prostration, he should have added to the solution the day previous to operation a drachm or two of concentrated tincture digitalis, and if he is to have gas oxygen anaesthesia he should have added to the last lot of solution before discontinuing for the night, 90 grs. sodium bromide, with orders that if not sleeping by ten o'clock he should have a sedative administered so that he may have the benefit of that greatest of restoratives—sleep.

The stomach should have a lavage that last night and also on the morning of operation; this latter may be done on the table just prior to operation, in order that the full amount of rest may be obtained.

As soon as the anaesthetic is well under way an interstitial of normal saline should be instituted. If given into the axillae it is readily absorbed and may be continued slowly throughout the operation.

When the abdomen is opened, preferably to the left of the midline, the liver as well as retroperitoneal glands should be looked over for secondaries, and if none can be detected, then one may proceed to remove one-third, one-half, or three-fourths, or even practically the whole stomach, as the case may require, leaving if need be only a collar about the oesophagus to which one may attach a loop of jejunum.

If such precautions are carried out with meticulous care, one will be surprised at the smooth convalescence of these cases, but if we operate in a hurry to suit the caprice of the patient, the folly of the friends, or the whim of the family physician, disaster is likely to crown our best efforts.

CRANIAL AND INTRACRANIAL INJURIES*

Charles K. P. Henry

Montreal

A LARGE majority of cranial and intracranial injuries are due to automobile and street car accidents. You gentlemen may expect to see such cases in increasing numbers no matter where you practice. All traumatic head cases cannot be treated by hospital surgeons, and a proper appreciation of the nature of all such head injuries, and a correct estimation of their extent and severity, their prognosis and their proper treatment must be acquired by the successful and conscientious general practitioner.

At this clinic we shall attempt to give you a working knowledge of our methods of examination of such head injuries so as to enable you to estimate *the degree of intracranial damage*, as this rather than the actual trauma to the skull itself is the important factor.

Newspapers, the laity, and even medical men lay too much stress on the presence of a fracture of the skull. The only type of fracture of the skull that is *per se* of great importance is the depressed fracture. This always requires elevation, excepting the case of the small depressed "pond" fracture of infants, which will usually come out of itself. The compound skull fracture demands attention because of likely contamination and possible meningeal infection if not operated on and cared for as any other compound or open fracture. In all fractures of the skull damage to the meninges or the subjacent structures exists in *ninety-five per cent. of the cases*. This is what renders fracture of the skull so serious an injury. The mortality in this service† during eighteen months, up to June 1st, 1922, was 22.9 per cent. for all types of head injury; the accompanying table shows the relative frequency of operation and the mortality with and without operation.

	Total No. of cases	*Total No. of deaths*	*Number operated upon*	*Died*	*Not operated upon*	*Died*
1921....	50	11	18	3	32	8
1922 to June 1	24	6	4	3	20	3
	74	17	22	6	52	11

Mortality—22.9%

Linear, stellate and other fractures of vault or vertex, or of the base, simple or compound, influence the patient's welfare in the following manner:—

(1) The production of a laceration of the meninges or brain with resulting haemorrhage.

(2) The opening up of the accessory cranial cavities and orifices, which are sources of potential intracranial infection and may lead to meningitis or brain abscess.

(3) The associated lesions of nerves or blood vessels by fractures especially those through the base.

(4) The production of increased intracranial pressure; a condition to be described later.

We find eighty to ninety per cent. of head injuries are cases of concussion of the brain, in which temporary loss of consciousness, irritability, restlessness and other passing conditions result from a bruising or shaking of the brain without permanent gross brain lesion. This bruising occurs usually at the site of local trauma and by *contre coup* at the opposite side of the cranial sphere. These patients are usually found in a state of shock when first seen, and unconscious or recovering from unconsciousness, the degree of shock often not marked, and the unconscious state neither deep nor of long duration. The blood pressure shortly after the injury is low, the pulse may be rapid or slow, depending on the degree of shock. No external signs of head injury, or only minor signs may be present as in this case before you. On admission three days ago he showed a superficial abrasion on the scalp in the right parieto-occipital region with a small haematoma and pressure here was resented—evidently causing pain. There was also early seen an ecchymosis over the mastoid and the back of the right ear. In addition he gave evidence of severe headache, which on recovery of consciousness, he referred to the frontal region. He was violent, restless, irritable, and would not, or could not talk, but he showed no motor or sensory paralysis, and no alteration in normal reflexes; and no reflexes indicative of pathological conditions were present. He had received trauma to the skull posteriorly, and contusion by *contre coup* of the frontal brain area had probably taken place. Now he is conscious, rational, answers well and is apparently convalescing.

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*A clinical lecture given November 1, 1922, to the Fourth and Fifth Years of McGill University, at the Montreal General Hospital.

†The majority of the cases in this Service were in the wards under Dr. Bazin and Dr. Eberts and by their courtesy were placed in my charge.

All cases of head injury should be examined locally for signs of a depressed fracture; a local haematoma may simulate this or even conceal it. Local tenderness without obvious scalp trauma often indicates a linear fracture. The x-ray may reveal such, but is, in my experience, of more value in confirming the diagnosis of fracture, than in making the diagnosis for us. In our series we have diagnosed fracture three times to once when the x-ray revealed it. Therefore I am now less concerned with the positive x-ray report of a fracture than I was two years ago when I took over the care of these cases. Moreover, it is frequently impossible for some days to secure an x-ray because of the restlessness of the patient, and in gross depressed fractures operation has to be carried out first. X-ray does, however, reveal fractures of the vault which we could not otherwise have located, though they were suspected from the accompanying signs of intracranial lesion.

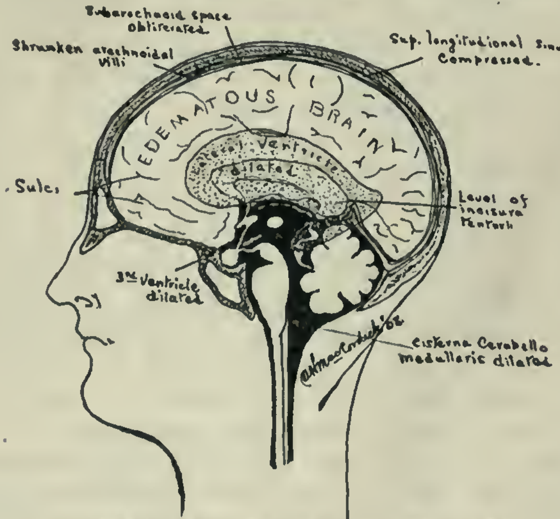
(1) The laceration of the meninges or underlying brain always causes some haemorrhage and the cerebro-spinal fluid will show the presence of blood, microscopic or gross, when we do a spinal puncture. It is said a lumbar puncture may fail to show blood when the haemorrhage occurs between the dura and the bone (middle meningeal haemorrhage), but in a couple of our cases the cerebro-spinal fluid showed blood and the pressure was high with a blood clot between the dura and the bone.

(2) The opening of air and other accessory cavities or sinuses, such as the frontal, ethmoid, nasal, mastoid, or auditory, can usually be readily diagnosed, and in our routine examination we examine the nares for blood, cerebro-spinal fluid, laceration of the mucosa, and nasal and septal fracture. Air in the subcutaneous tissues about the orbit or face often indicates a fracture running down from the vault to these air spaces. The ear must be carefully examined and in about twenty per cent. of our cases we find aural bleeding and in about five per cent. an escape of cerebro-spinal fluid from one or both ears. Antiseptic and aseptic care is of the greatest importance to prevent meningitis and cleansing must be by swabbing and packing lightly with sterile gauze; syringing is dangerous.

(3) A methodical examination of the muscles and areas supplied by the cranial nerves will often show that a basal fracture exists; the nerves oftenest disturbed are the third, the sixth, the seventh and the eighth cranial nerves. I show you here to-day a man who presented on admission paralysis of the left seventh nerve (the facial) which has remained, so he cannot close the left corner of his mouth, nor shut his eyelids on the left side. At one time we had in one ward three cases showing paralysis of the facial nerve on one side. Two of them turned out to be old cases, one showed a scar of a mastoid operation and one a scar in front of the ear lobe; both showed chronic conjunctivitis indicating an eye imperfectly protected by partly open lids. These cases often cause difficulty in the localization of the side or site of the cranial lesion. An ophthalmoscopic examination of the eye to detect the presence of any papillary oedema or optic neuritis may be made, but such examination is, fortunately for the average man, an unnecessary trouble. In our series our retinal examinations are productive usually of negative reports. I believe I have not had one case where this examination, though done in a large series by Drs. Mathewson and McKee, has helped me or the patient in the traumatic cases. On the contrary the careful clinical examination of the extra-ocular muscles and of the pupillary reflex is most important. Unequal pupils, dilated pupils, light-fixed pupils are of grave omen if persistent; the fixed pupil, if dilated as it nearly always is, in a case of deep unconsciousness with absent motor function is grave prognostic value. The general examination reveals quickly enough motor or sensory paralysis, the careful checking over of the deep and superficial reflexes and the testing for pathological reflexes, for example Babinski's, is of value. To ensure a careful general examination and record of all this I have had drawn up the forms I pass around, and on which you see there is provision made for recording all general and special examinations.

When we have finished this general examination and the scalp wounds have been examined for underlying fracture and treated surgically we are still short of securing the most important evidence needed. By this I mean the estimation of the intracranial pressure and the character of the cerebro-spinal fluid.

(4) First let us consider what is meant by the *circulation of the cerebro-spinal fluid.* This fluid not only serves as a water bed for the brain and protects it from the jolts and jars like an automobile shock absorber, but it has a definite source, a regular flow and a steady absorption. In health and in diseases not affecting the central nervous system these three factors are so evenly balanced that its pressure as measured in the horizontal position in millimetres of mercury by lumbar puncture is from seven to nine in the adult and five to seven in the child. The active source of the secretion, the choroid plexus, is seldom if ever altered by injury or disease. The ependymal cells lining the ventricles, the pituitary gland with its stalk from the third ventricle, and the metabolic processes of the cerebral cells add also to the fluid. The quantity in the ventricles and the aqueducts is about 30 to 60 c.c. In hydrocephalus immense quantities are dammed back in the ventricular system, and I have emptied 100 c.c. from one lateral ventricle by puncture. The subarachnoid spaces hold 60 c.c., the spinal cord about 20 to 30 c.c., so we have a normal total quantity of about 120 to 150 c.c. Its flow is outwards towards the fourth ventricle, then via the foramina of Majendie and Luska to the large cisternae at the base of the brain, around the cerebellum, above the pons and then passes by channels up over the hemispheres beneath the arachnoid towards the sinuses, especially the superior longitudinal, where it is absorbed by the villi and Pacchionian bodies. Some of it is taken up by the perivascular lymphatics. The fluid to be absorbed must enter the main cranial cavity by passing through the intertentorial space which is well filled by the mid brain.

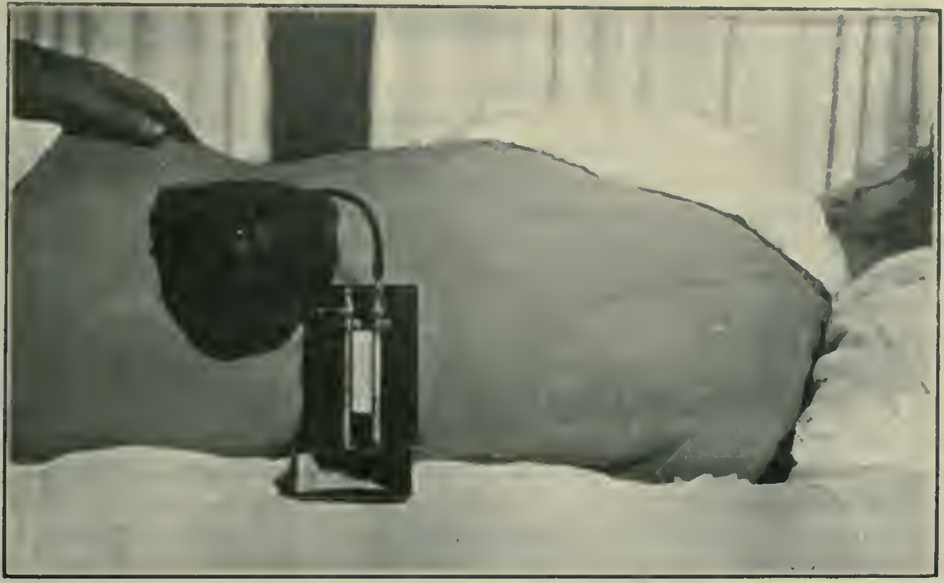

Subarachnoid space obliterated
Shrunken arachnoidal villi
Sup. longitudional sinus Compressed.
EDEMATOUS BRAIN
Lateral ventricle dilated
Sulci
Level of incisura tentorii
3rd Ventricle dilated
Cisterna Cerebello medullaris dilated

INCREASED INTRA-CRANIAL PRESSURE.
Absorption Blocked

The negative or low pressure in the venous sinuses, the pressure of gravity from the ventricles to the base and the regular pulsation of the brain are the forces that keep this fluid moving. Now when trauma occurs haemorrhage adds to the fluid content and the damaged brain and subarachnoid areas about it interfere and often block a part of this absorbing path. Back pressure results, the increased intracranial and intraventricular pressure pushes the brain against the skull, flattens the sulci and convolutions and interferes with the flow into the sinuses. The pressure on the floor of the fourth ventricle causes a rise of blood pressure, a slowing of the pulse and respiration, and the symptoms we commonly call medullary oedema or pressure. The intertentorial space is enroached upon by the rising and swollen brain and absorption is still more interfered with, and thus a vicious circle is established. If you do a lumbar puncture you find blood in the fluid withdrawn and *the pressure reading is above normal.*

Lumbar puncture, which I will now carry out on this first case, is the best procedure I can offer you for the reduction of this increased intracranial pressure. It is also the only accurate way I know of estimating the amount of pressure. Cerebral oedema occurs with increase of pressure and will often prove fatal, or if not high enough or long continued enough to lead to a fatal ending may cause secondary fibrosis or gliosis of the cerebral cells with the familiar delayed symptoms of cerebral injury; persistent headache, loss of memory, and a disinclination or inability to concentrate on any work. In a large series of head cases with a "follow up" examination ten per cent. of such cases of fractured skull were found to have degenerated into social derelicts. On admission three days ago this case had a puncture done and the fluid was red, and under pressure; the procedure was extremely difficult because of the restlessness and irritability of the patient. No reading was taken of the pressure. In this test tube you see the red fluid after we shake it to mix the blood and the supernatant clear fluid. The next day he was partly conscious and (forty-eight hours ago), I did a lumbar puncture and secured this pinkish fluid at a pressure of 20 m.m. of mercury, which I reduced to 10 m.m. by withdrawal of about 15 c.c. To-day you see he can talk and is less restless, has regained his bladder control, takes fluids, and now you see the fluid is brownish and turbid and the pressure is only 10 m.m. You note that we turn the tap so as not to allow the fluid to escape before we take the reading, as a few c.c. make considerable difference in some cases. Usually not more than 10 to 15 c.c. is enough to reduce the pressure fifty per cent., but it should not be reduced below 10 m.m. at any time in the adult. We use this graduated tube to collect the fluid, and the reading is easily seen on the mercury scale in the enlarged photograph I pass around. Cloudy fluid is examined microscopically for bacteria and red cells, and a culture is taken when meningitis is suspected. One case now downstairs showed at the first puncture, clear fluid with a cell count of eight to fifteen red cells per field, and to-day his fluid is distinctly cloudy. The fluid is usually red or pink; our readings show pressures from twenty to thirty-five in severe, and from twelve to twenty-five in moderately severe cases.

By repeated punctures the intracranial pressure can be controlled better than by a subtemporal decompression as carried out by Cushing. In cases without depressed fracture or without gross meningeal or subdural haemorrhage I believe this treatment offers a better chance for cure than by such an operation. Since June, 1922, I have operated on only one or two cases, and with the exception of two or three cases dying within a few hours of admission with gross cerebral and other lesions, where no operation could have been of value, all cases have walked out of the hospital. Some, of course, have temporary or permanent disability, as in case 2 shown here with paralysis of the right upper extremity and the left side of the face. As soon as pressure is relieved the cases regain consciousness, or if conscious, become brighter, and the headache is often promptly and completely relieved. There is apparently no danger in spinal puncture in a horizontal posture in head injuries if the fluid withdrawn is not too great in amount, from 10 to 15 c.c. for the first puncture; and it has never been necessary to withdraw more than 20 c.c. at any time to secure a sufficient reduction of the pressure.



Spinal Manometer *in Situ.*

Let us summarize our procedure:

(1) Examine the patient generally, noting gross physical injuries and minor scalp or skull injuries.

(2) Note the intelligence, whether rational or not, test the memory, if conscious, and the other mental functions.

(3) Examine for motor and sensory disturbances, and for normal and abnormal reflexes, superficial, deep and organic.

(4) Examine the function of all the cranial nerves, especially the third, fourth, sixth, seventh and eighth.

(5) Record all findings at the time of first and subsequent examinations, noting pulse, respiration, temperature and blood pressure.

(6) Do a lumbar puncture; if high, reduce fifty per cent.; repeat in twelve or twenty-four hours, whether first shows blood or increased

pressure or not. Cerebral oedema may follow even where primary signs of increased pressure are wanting. Repeat every day or second day where pressure is high, irritability persists and unconsciousness is present. When the fluid is normal, no further puncture is needed after the second or third.

(7) Absolute rest in bed must be carried out for from two to three weeks after pressure becomes normal. Ice to the head, and morphia or other sedatives are required in most cases of cranial injury.

(8) Freedom from mental or physical work is desirable for at least one month more where the cerebro-spinal fluid has shown the presence of blood or any increased intracranial pressure.

PNEUMONIA*

Geo. G. Melvin, M.D., D.P.H.

Fredericton, N.B.

In casting about for a topic upon which to say something in some way timely and practical and also in as few words as possible, it occurred to me that no subject would better fit the occasion than pneumonia.

That it is a trite topic no one will deny; trite, not because of its relative novelty, but because of its absolute age, an age amply sufficient for our ancestors of many generations back to have expended their wisdom upon.

"Lung Fever" to give it its Anglo-Saxon name, since vital statistics became common to most countries of Western civilization, has been the greatest cause of mortality of any single disease in the Standard or International List. While this statement may not be exact as to every year and of every community publishing its death returns, yet it will be found to be so in all considerable communities during the lapse of a considerable number of years.

In our own province, though our figures cover only a year or two, pneumonia maintains its ill-omened reputation. During the year 1920, in New Brunswick, exclusive of Kent, there died of pneumonia and its close congeners, broncho-pneumonia, pleurisy, pulmonary congestion and pulmonary gangrene, 547 persons making a mortality rate of 151.51 per 100,000 people. If, in addition to this, are added twenty-nine other deaths attributed to acute bronchitis, deaths more than likely to have been disguised or unrecognized pneumonia, there is presented a list of not less than 576 pneumonia deaths in this province in a single year, exclusive of one of its average sized counties, and exclusive of the due proportion of pneumonic deaths in 1,000 deaths registered during that year without definite cause of death stated.

Contrasted with these figures, the mortality from tuberculosis in all its forms of 390, a rate of 108 per 100,000 takes a decidedly second place. Even senility or old age bulks but 461, or a rate of 128 per 100,000 while the intestinal diseases of children under two years yielded a harvest of only 303, or a rate of 84 per 100,000, and cancer 266 deaths with a rate of about 74. Certainly, there can be no question of the gravity of pneumonia amongst us as well as with those of the north temperate regions, generally. Yet no great outcry is made with respect to it. It carries off the young, the middle aged, and the old with an impartiality striking in its simplicity each year, only relaxing its activities from May to September. Even during these months of relative warmth forty-seven males and twenty-seven females died of direct lobar pneumonia in New Brunswick in 1920.

Compared with tuberculosis its morbidity is less. The one is, in general, prolonged in its progress, the other, sudden and brief. Of all deaths, however, that from tuberculosis can best be prepared for: that from pneumonia, apart from accident, perhaps the least. No disease, therefore, ordinarily, causes such wide-spread distress, in every meaning of the term, as does pneumonia. It comes unheralded, strikes savagely and surely and leaves the physician embarrassed and the family concerned, often in ruin. No laboured explanations can assuage the blow, nor can any assurance by the preventive authorities be given that it may not be repeated at any time or in any place.

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*Chairman's Address, Section of Medicine, New Brunswick Medical Society Meeting, July 18th, 1922.

These are melancholy admissions to be forced to make in this age of precise and successful treatment, and amidst the triumphs of preventive medicine. We hear much, and deservedly so, of the ravages of cancer and of the unwearied efforts that are constantly being put forward to throw light upon this disease and consequently, to obtain a better control of it. Yet pneumonia presents a question of about twice the importance of cancer, if we dare measure the importance of any cause of death by its activity.

But the problem involved in cancer is much wider than that in pneumonia. The pathology of the former is really wrapt in obscurity: that of the latter has long been well understood in all its outstanding characteristics. It is in treatment that the two diseases maintain their sinister and equal preeminence, and it is almost impossible to speak of the treatment of pneumonia without that confusion which invariably accompanies non-success and defeat in the hands of the honest.

For that reason it is not only disagreeable but useless to attempt to review at any length the history of the treatment of pneumonia during, say, the past forty years. It has ranged from pure empiricism down to the dictates of stilted and wholly ineffectual theory. Bacteriology, to which medicine owes so much during the past half century has done practically nothing so far as this disease is concerned. We talk learnedly, but not wisely, of the pneumococcus and its multitudinous varieties: we purge and abandon purging: we reduce temperature by means which even the most robust in the prime of health could hardly sustain, and again permit it to run its high course in the futile hope that it is nature's method of destroying the specific germ. We drug to the point of toxicity and presently abandon all drugs as not only useless but vicious and inimical. Alcohol was the sheet anchor yesterday; to-day it is reprobated by a large part of the profession. We leap from theory to theory; we pathetically pin our faith to applications and preparations which are more than half nostrums and which are wholly useless, and finally resign our patient to what we hope will be the commonsense and tender handling of the trained nurse.

Is it a consequence of this erratic course, or is it in spite of it that pneumonia maintains its enormous stride at the head of death's procession? This may well be called a vital question and one we should commend to ourselves for grave consideration. And, indeed, it is for this very purpose that I here present this simple note. In the way of improved treatment I have nothing to suggest, and as one engaged in the public health service I confess to an almost equal ineptitude so far as this disease is concerned. It has been made notifiable, it has been quarantined, it has been fumigated—all the useful and useless restrictions of sanitary science have been applied to it times without number and in the most diverse places without the smallest appreciable effect either upon its incidence or mortality. Enthusiasts of the moment both in treatment and prevention, will, I do not doubt, repudiate the assertions here expressed, and confidently show that this disease, as it has always been, is just now on the point of eradication by methods, all their own, of either "up-to-date" treatment, or equally "up-to-date" prevention. While we doubt, let us, at the same time, pray that our sanguine friends, some of them, against all byegone experience, may achieve success.

But the declaration of this pious wish is not the incentive of this note. My only purpose is the expression of a saner and more rational hope, and that hope is that some younger man, listening to me to-day, or reading these words elsewhere, gifted with the requisite information, ability, judgment and modesty, may take up this question of pneumonia, and pursuing it patiently at the bedside and in the laboratory, may finally so disentangle it that his labours will confer immortality upon himself, and prolonged life upon humanity in general.

HEMOLYTIC STREPTOCOCCIC INFECTIONS IN CHILDREN

I. H. Erb, M.B.

Pathologist to the Hospital for Sick Children, Toronto

THE circumstances which led up to this study may be stated briefly as follows:

Not long after becoming associated with the Hospital for Sick Children, we were impressed with the frequency with which cultures from various types of inflammatory lesions showed the presence of hemolytic streptococci. We also noticed that a large number of the cases coming to post mortem had died as the result of an infection with this organism. Still later we observed that many of the fatal cases originated as inflammatory lesions of comparatively little significance, but which nevertheless, from some cause or other, progressed to a fatal termination. With a view towards determining the mortality in these cases, the seasonal incidence and the more common types of primary lesions, we have made a study of all the cases during the two and a half years ending December 31st, 1921, from which this organism was isolated either in pure culture or in conjunction with other organisms.

The series includes patients who were admitted to the wards of the hospital and also some who attended the Out Patient Department. Cultures in every case were made on glucose broth and on sugar-free blood agar plates, using citrated human blood. In all cases in which "septicemia" is reported, this diagnosis was confirmed by positive blood culture findings.

The types of lesions produced by this organism are of great variety, involving almost every tissue in the body and including such conditions as erysipelas, cellulitis, osteomyelitis, pneumonia, empyæma, pericarditis, peritonitis, meningitis, septicemia and many others. From this we can readily see that vital statistics are of no value in endeavouring to determine the proportion of deaths due to an infection with this organism. In order, therefore, to arrive at any definite conclusions, we have gone over our records for the past two and one-half years and present our findings herewith. The number of cases forming the basis of this study totals 350. Males were more commonly affected than were females, there being 215 males and 135 females. There were 156 fatal cases, but in eleven of these death was due to some cause other than the streptococcic infection, such as tuberculosis, congenital syphilis, malnutrition or some other disease. Deducting these eleven cases, we still have a total of 145 cases in which death was due to the hemolytic streptococcus, the mortality rate being 38.6%. While this figure represents the mortality in our series, it no doubt is rather high as there were during this period quite a few cases of tonsillitis from which cultures on blood agar were not made, and who made a good recovery.

The seasonal incidence of these cases with the corresponding number of deaths may be graphically represented as shown by Chart "A". Thus we see that the months of the year in which the greater number of these cases occur are the winter and early spring months; January, February, March and April being the worst. During this period there is also a corresponding increase in the number of deaths. In the summer months, and particularly in the month of August the cases are considerably less numerous. During the

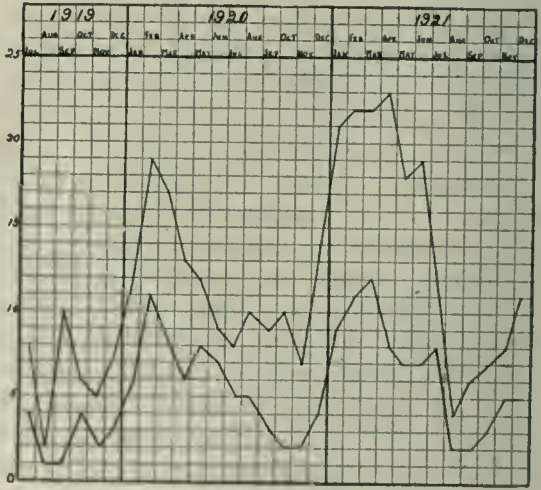

Chart A.—Seasonal Incidence

Upper line, No. of cases of streptococcic infection.
Lower line, No. of deaths per month due to streptococci.

two and one-half years which this study covers, there were in the hospital 1,333 deaths from all causes. When we consider that 145 of these, or almost 11%, were due to a common cause, that cause being the hemolytic streptococcus, we begin to realize the important part which this organism plays in the production of disease and in the mortality rate, particularly among children. By comparing the deaths per month due to the streptococcus with the total number of deaths from all sources, as shown in chart "B", we make this interesting observation that, during the months of August, September and October in each of the three summers, the total number of deaths was the highest, while the number of deaths from streptococcic infection was the lowest. The explanation of this lies in the well known fact that during these months respiratory infections are comparatively uncommon, while intestinal disturbances are very prevalent.

When we come to study the age incidence of these cases, it is interesting to note that while the ages vary from a few days to fourteen years, 114 cases, or almost 30% occur in infants under six months of age. This fact is illustrated in chart "C". From six to twelve months there are twenty-five cases, and from here on, with few exceptions, there is a gradual but steady decline in the number of cases as the children grow older, until we reach the age of fourteen years, of which age we have only four cases to report. The significance of this appears to be that infants are very susceptible to this type of infection, and the death rate is high, as is shown by the chart.

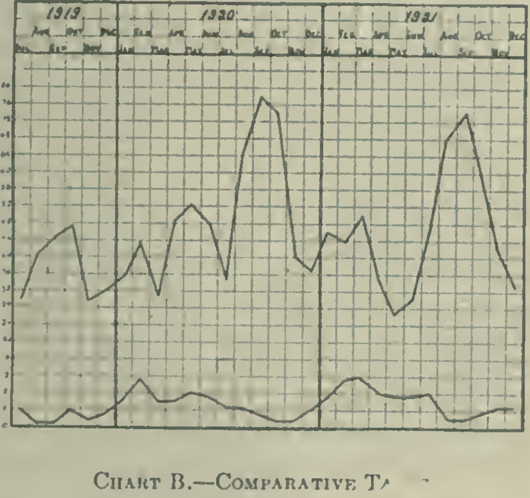

CHART B.—COMPARATIVE T

Upper line, No. of Deaths per month—all causes.
Lower line. No. of Deaths per month—due to Streptococci.

ANALYSIS OF CASES

Group	*Cases*	*Deaths*	*Percentage of deaths*
1. Pneumonias (not secondary to streptococcic infections elsewhere in the body)................	42	20	48
2. Primary lesions other than pneumonias...........	51	16	31
3. Infected wounds.........	49	8	16
4. Cases associated with scarlet fever.............	7	2	29
5. Tonsillitis, nasopharyngitis or otitis media without secondary lesions...	33	0	0
6. Cases originating as nasopharyngitis, tonsillitis or otitis media in which the lesions did not remain localized to these areas.	128	75	58.6
7. Erysipelas.............	17	13	66
8. Omphalitis.............	14	13	93
9. Unclassified............	11	6	54

Group 1.—Cases of pneumonia not secondary to streptococcic infection elsewhere in the body. Number of cases, forty-two. The ages varied from twelve days to thirteen years; average, five years, eight months. This group includes all the cases of bronchitis, broncho-pneumonia and empyæma due to hemolytic streptococcic infection, which did not appear to be secondary to such conditions as nasopharyngitis, tonsillitis or otitis media caused by the same organism. Fourteen of these cases were secondary to such conditions as measles, influenza, malnutrition, fermentative diarrhoea, or some other disease. In eight cases hemolytic streptococci were found associated with other organisms; pneumococci, five cases; staphylococcus aureus, two cases; an unidentified Gram negative bacillus, one case. Twenty-two cases, or over 50%, developed empyaema, with seven deaths and fifteen recoveries. The number of deaths from all causes, twenty. The number of recoveries, twenty-two. Three of the forty-two cases had septicemia, all of which died. The percentage of deaths in this group is 48%.

Group 2.—Primary lesions other than pneumonias. Number of cases, fifty-one. The ages varied from two weeks to twelve years. Average eight years, 8 months. This group includes ten cases of primary peritonitis with only one recovery; eight cases of osteomyelitis with seven recoveries; and thirty-three other cases in which the lesion was an arthritis, a septicemia, a meningitis, or some other condition which did not appear to be secondary to a lesion elsewhere in the body. The percentage of deaths in this group due to streptococci is 31%. Two other cases died, one of malnutrition and one of pulmonary tuberculosis.

Group 3.—Infected Wounds, Burns, etc. Number of cases, forty-nine. The ages varied from seven days to fourteen years, average, seven years. Beside the infected wounds, which include lacerations, abrasions, compound fractures, etc., there are included three cases of infected burns and nine cases of infected tuberculous sinuses, none of which died. Among the cases of actual wound infection there were eight deaths, or 16% of the total number in the group. An interesting point about this group is the higher average age (seven years) associated with a lower mortality (16%). It would seem to indicate that older children withstand this type of infection much better than do infants.

Group 4.—Cases Associated with Scarlet Fever. Number of cases, seven. The ages varied from three to twelve years, average seven years. Only one of the cases showed no secondary lesions. Of the others, two had arthritis, two mastoiditis, one cervical adenitis, one septicemia and one meningitis following mastoiditis. The last two cases died. The percentage of deaths was 29%.

Group 5.—Cases of tonsillitis, nasopharyngitis, otitis media and conjunctivitis without secondary lesions. Number of cases, thirty-three. The ages varied from one month to fourteen years; average five years, four months. These patients were either cases of primary infection of these areas, or those in which the conditions developed during the course of some other illness. The interesting point is that there are only three deaths in this group and these were all due to other causes, one patient dying of post-diphtheritic paralysis, one of congenital heart and one of pulmonary tuberculosis.

Group 6.—We now come to a group of cases which is of comparatively more importance, first of all, because of the high mortality, and, secondly, because the fatalities are secondary to what may be considered comparatively minor lesions. These so called minor lesions are the same as those in the preceding group, *viz.*, tonsillitis, nasopharyngitis and otitis media, but this group differs from the former in that the lesions in these cases did *not* remain localized to these areas, but became more or less general, with in many cases, fatal results. The number of cases in this group is 128. The ages vary from two weeks to thirteen years. Under six months of age there were twenty-eight cases; from seven to twelve months, twenty-nine cases; and over one year of age eighty cases. The number of deaths was seventy-nine, but of this number four were due to other causes, leaving seventy-five deaths due to streptococcic infection, or a mortality rate of 58.6%. One history rather typical of this group may be recorded here:

Patient Eva E., age seven years, female. was admitted to hospital September 15th, 1919, giving a history of sore throat and fever commencing ten days previously. Two days later she complained of pain and tenderness behind her ears. On September 10th (five days before admission) her ears commenced to discharge, and with the discharge the pain was lessened. On the day of admission the temperature was 104.4°F., and she complained of pain in her left elbow and left wrist. Her white blood count was 33.000. On September 18th, the blood culture was positive for hemolytic streptococci and the same organism was isolated in pure culture from the ears and the left elbow joint. On September 20th, the patient was transfused, but without any marked improvement. She ran a septic temperature and ultimately died on October 8th, about one month after the onset of the illness, with septic pneumonia and acute nephritis.

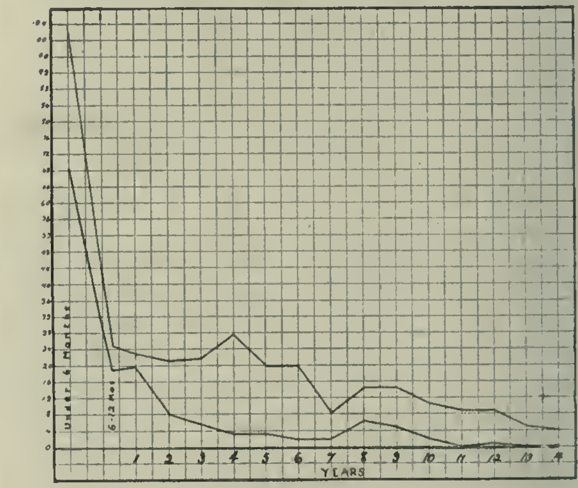

CHART C.—AGE INCIDENCE

Upper line. No. of cases according to age.
Lower line, No. of deaths according to age.

This sequence of events is repeated over and over again in this group of cases until it cannot help but impress on one's mind the importance of sore throat and middle ear disease in children. Some idea of the course of the infection and the final outcome of these cases may be obtained from the following table:

Septicemia	developed in	38	cases with	only	2	recoveries.
Peritonitis	“	7	“		0	“
Broncho-pneumonia	“	22	“	“	2	“
Septic pneumonia	“	12	“		0	“
Empyema	“	6	“	“	2	“
Arthritis	“	9	“		0	“
Pericarditis	“	2	“		0	“
Osteomyelitis	“	4	“	“	2	“

Of the twenty-one cases which developed intracranial lesions, fifteen had meningitis, six had thrombosis of some, or all of the intracranial venous sinuses, one had a cerebellar abscess and one had a cerebral abscess. All of these cases died.

We might mention that the two cases of septicemia which recovered were cases which had been exsanguinated and transfused.

Group 7.—This group includes the cases of erysipelas from which the hemolytic streptococcus was isolated. The number of cases is seventeen. The ages varied from seventeen days to six months, the average being eight weeks. In eight of the cases the erysipelas originated in the region of the head, (eyes, ears, nose, face); in seven it originated in the region of the buttocks, scrotum, penis or vulva, and in two it began at the umbilicus. Blood cultures in every instance were positive. The number of deaths was thirteen, or there was a mortality of nearly 66%. These cases may be divided into two groups; first those exsanguinated and transfused, and, second, those not transfused. Of eight cases not transfused, eight, or 100% died. Of nine cases transfused only five, or 55% died: Reduction in mortality of 45%.

Group 8.—The Cases of Omphalitis. While this is a comparatively small group, yet it is an important one, in as much as it is attended with a very high mortality. There are fourteen cases in the group, two of which are also included in Group 7. The mortality was 93%. The ages of these patients varied from eight days to one month, only two were over three weeks, and the average age was seventeen days. All of these cases began as an inflammation of the umbilicus, but in only one case did the inflammatory condition remain confined to that area. This was the only case to recover. In the remaining thirteen cases, all of which terminated fatally, a variety of lesions developed. Peritonitis occurred in nine cases, septicemia in nine cases, erysipelas in two, multiple abscesses in two, pericarditis in one and gangrene of feet and hands in one.

Group 9.—This is a group of unclassified cases which totals eleven in number, and includes a few rather rare cases. For example, one patient died as the result of cellulitis following a streptococcic infection of chicken pox. Another patient died apparently of septicemia and pneumonia following an alveolar abscess. The ages varied from nine months to thirteen years; the average age being two and one-half years. Of these eleven cases, six died as a result of the infection, while one died of pulmonary tuberculosis.

Summary:

(1) Males are more commonly affected than females.*

(2) Nearly 40% of all the cases were fatal.

(3) The greater proportion of cases occur during the months of January, February, March and April.

(4) Very few cases occur during the months of August, September and October, during which months the death rate from other causes is the highest.

(5) Almost 11% of deaths from all causes are due to infection with this organism.

(6) Infants are very susceptible to this infection, 30% of all cases occurring in babies under six months of age.

(7) 44% of the cases of broncho-pneumonia* developed empyema, 40% of which cases died.

(8) 90% of the cases of peritonitis died.

(9) Over 50% of the deaths in this series followed upon tonsillitis, nasopharyngitis or otitis media.

(10) Erysipelas in infants is frequently associated with septicemia and when this is the case with ordinary methods of treatment, it is usually fatal.

(11) Practically all cases of umbilical infection die.

In placing these rather discouraging facts before the medical profession, we wish to ask this question; can anything more be done by either prophylactic or therapeutic measures by which, in the future, many of these young lives may be saved?

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*This includes the cases in groups 1 and 7.

THAT BANEFUL CATHARTIC AFTER ABDOMINAL OPERATIONS

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Kingston

An article appeared in the November number of *Surgery, Gynaecology and Obstetrics* entitled "The Harmful Use of Cathartics After Abdominal Operations," by Dr. Long, of Oklahoma. It was gratifying to note that some one has the courage to openly anathematize cathartics in this connection. It is especially pleasing to any who hold similar views, to see a man in an influential position such as his, with pronounced convictions on a subject so important. It is true, opinions differ widely on this question. Many may oppose his teaching. Personally, I hold that his contentions have been proven by experience and are consistent with sound reasoning. I have for a long time felt, that in the interests of humanity an effort should be made to bring before the profession the advantages of omitting the time "dishonoured" dose. No doubt, there are not a few holding the same belief, who have kept silent to avoid controversy. It always seemed to me, before departing from the orthodox practice, that there was room for improvement in the post-operative management of this type of case. The popular method especially in severe peritonitis, was decidedly unscientific. The futility of employing the measures recommended in standard works, demanded a change. If dosing were useless, I resolved to make the sufferer comfortable and let nature do the rest. Since then I have not changed my attitude. Further experience and closer observation have served to confirm rather than alter my convictions. Since adopting present methods, I have treated in the neighbourhood of two hundred cases, practically along the lines Dr. Long has laid down. The results have been such, that I have no inclination to revert to the old practice. Up to the time of writing, I have adhered rigidly to these principles in above one hundred and thirty cases in one of our local hospitals. These representing every variety and degree of peritonitis, were treated surgically by myself and in no case was a post-operative cathartic given. There was no mortality in this list. Considering their respective states at the time of operation, their convalescence might be called pleasant, as contrasted with similar cases before changing my tactics. Let us begin with the clean case, for example the common interim appendix. How many times have we seen the patient bright and quite normal on the third morning? According to recognized usage, he is given a dose of calomel. Next visit he is restless and more miserable than on the day following operation. It now requires seventy-two hours to recover what was lost. It reminds one of the frog jumping out of the well. This is done in the name of science. One cannot expect whipping to overcome a functional paralysis of the bowel, when such is better accomplished by quiet. Rest is essential to repair. Why worry in this type of case? It matters little whether the bowels move or not, until new conditions develop. Bowels never die in a flat abdomen, much less in one which is by this time nearly scaphoid. They will resume their normal functions, when normal tone returns. Twenty ounces of saline daily for three days, administered by Murphy drip will usually do all that is required by the time the gut has recovered. If not, the enema given on the fourth or fifth day as Dr. Long suggests, will remove any obstacle from the colon and do all that is necessary. I have been leaving the enema off until the fifth or even sixth day, as I believe it to be of advantage in certain cases. I rarely give a cathartic before the eighth day and I even think it better deferred, in the majority of cases, until the patient goes home. A hot seidlitz powder may be desirable at the end of the first week, if the patient lose his relish for food. To prevent an adhesive exudate from forming on the surface of the bowel abraded by handling, it is as necessary to withhold cathartics after operation, as immediately before, to avoid the congestion that naturally attends an artificial diarrhoea. This is quite the opposite of the view held by many, but I have had less trouble from adhesions since adopting this principle. So much for the mild case; consider now the acute abdomen. Under this heading, we will include every variety and degree of inflammation, from a moderate local reaction to a generalized peritonitis. In this type of case the cathartic is not only contraindicated but is harmful, and at times exceedingly dangerous. Allowing that the cathartic given at the customary time works well, what will more effectively spread an infection over the abdominal cavity, than active peristalsis? Is this to be desired? Nature usually permits the intestine to function normally, after she has built up a limiting wall at the site of the invasion. The calomel zealot unwittingly defeats that which he strives to attain. In the distended abdomen purgatives are worse than useless. The more calomel, salts and croton oil, one pours in, the tighter will nature put on the brakes, reflexly. Remember that distention is not at first paralytic, but rather an indication, that nature would put the bowel temporarily out of commission to limit the spread of infective material. When this stage is overdone, a genuine intestinal paralysis supervenes on a functional. I have been able to demonstrate time after time that untoward conditions are produced and evil symptoms aggravated by everything introduced into the stomach. That anything in the stomach is undesirable is proven by the incessant vomiting seen in many of these cases, which in the more desperate becomes effortless and gushing. It has been noted that this distressing feature is more in evidence after a purgative has been administered and greater distention has occurred. Anything put into the stomach excites peristalsis, but when normal peristalsis is impossible it is forcibly ejected. The main indication here is to assist the stomach in getting rid of its foul contents before more perverse conditions develop. The stomach tube and a pitcher of water is all that is required and a great relief it is to the patient. A solution of sodium bicarbonate is preferable to plain water, especially in any degree of gastric dilatation. It is pleasing to note that the stomach tube is daily coming more into prominence in cases of this kind. While a little disagreeable to swallow, it is very efficacious, and is better employed before the patient is in a state of collapse.

While I am not giving a dissertation on the treatment of peritonitis, the reader naturally expects an alternative when cathartics are interdicted. I would like in this connection to emphasize the value of certain other measures in this distressing condition. There is nothing so ridiculous as the old teaching that morphin produces intestinal paralysis. It does not, unless used in toxic doses. There is nothing quite so beneficial as morphin with atropin given hypodermatically. Morphin will lock up the bowels in a normal abdomen, but the effect is quite the opposite in the presence of distention. This I have proven to my entire satisfaction a number of times. Whatever dosage is necessary to quiet the patient, will relax and promote the expulsion of gas. With the aid of the stethoscope, borborygmi can usually be heard within twenty minutes in an abdomen that has been silent for hours. This with the assistance of enemata helps to prevent overdistention and the gut will gradually recover its tone. There is nothing to justify one in letting these patients suffer, when a quarter grain of morphin will relieve pain and apprehension and induce a needed sleep. This may be repeated if necessary in a few hours. There is nothing to contraindicate quarter grain doses in the adult and proportionate doses for children. It is well to combine one hundredth of a grain of atropin with morphin when the effect of a single dose is desired, but if the dose is likely to be repeated, the standard dosage of 1/150 of atropin is preferable. Further medication is not necessary. The instillation of saline by Murphy drip, if retained, and sodium bicarbonate solution to maintain alkalinity, or glucose, as is commonly used in threatening acidosis, will be quite sufficient. Dilution is of paramount importance to combat toxaemia and prevent dehydration. It is essential that these patients get all the rest possible. Too many are nursed and "doctored" to death. A little assurance will go a long way in helping the sick to recover. If he be a smoker light up his pipe. Although it may be distasteful to him at the time, it must not be forgotten that the pipe is quite as efficient as atropin in assisting the expulsion of gas. I once saw a cigarette produce marked results in a stubborn case of tympanites. The physiological side of the discussion is familiar to most of us. To such as care to refresh the memory, it will be found that the action of morphin and atropin on the nervous mechanism of the bowel is quite in keeping with my contentions. There is still something to be learned about the sympathetic nervous system.

No apology is necessary for the repetition of well known facts. The seriousness of the subject justifies reiteration for emphasis. While my statistics to date are neither large nor complete, I have observed enough from this practice to warrant the stand taken. Before adopting present methods, my results were scarcely the average, since then they have exceeded my greatest expectations. I could not conscientiously administer nor recommend a post-operative, cathartic to any abdominal case. I do not hold that all desperate cases will recover, even under the best management. The virulence of the infection and individual peculiarities have much to do with determining the issue. Barring the unusual, if the patient's condition will admit of proper peritoneal toilet, we should expect a favourable outcome.

ANALYSIS OF SIXTY CASES OF GASTRIC ANACIDITY ASSOCIATED MAINLY WITH CHRONIC DIARRHOEA AND PERNICIOUS ANAEMIA*

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SIXTY cases of gastric anacidity, occurring in my private practice, have been analysed to illustrate mainly the diagnosis and treatment of certain forms of chronic diarrhoea, and the early diagnosis of certain types of pernicious anaemia.

Gastric anacidity is frequently found in apparently healthy persons, especially beyond middle age; it is often present in cancer of the stomach and abdominal cancer generally, in long standing cases of gall-bladder disease and chronic appendicitis, in chronic cardiac, pulmonary, hepatic and renal disease, as well as in disorders of the thyroid and suprarenals: such cases are excluded from the present paper.

Though the association of gastric anacidity with chronic diarrhoea and with pernicious anaemia has been recognised for many years, yet the practical importance of the subject is not sufficiently appreciated by the general practitioner.

I. *Gastrogenic diarrhoca*—In many cases, a careful history of the patient suffering from chronic diarrhoea should be sufficient in itself to arouse suspicion of its gastric origin. Thus in 18 of 29 cases of chronic diarrhoea, associated with gastric anacidity, the diarrhoea occurred mainly, either in the early morning before breakfast, or immediately after meals, or on both occasions; in the remaining 11, diarrhoea followed on chilling in 3 cases, and quite irregularly in the other 8. These peculiarities of gastrogenic diarrhoea have been pointed out by many observers, *e.g.* recently by Vander-Hoof.

Sex, age and race: 17 were females and 12 males; 2 occurred in individuals over 60; 8 between 50 and 60; 7 between 40 and 50; 8 between 30 and 40, and 4 between 20 and 30 years of age; 4 belonged to the Jewish race.

Duration of diarrhoea when first seen: less than one year, 5 cases; 1-5 years, 11 cases; 5-10 years, 3 cases; 10-20 years, 4 cases; over 20 years, 6 cases. Number and type of motions: 3 to 7 motions daily on an average up to 20 daily; loose, watery without blood, occasionally said to to contain mucus; usually with little or no pain, though sometimes with colic which was exceptionally severe.

The diarrhoea was usually in spells, lasting a few days up to a week or two at a time, with intervals of freedom for weeks or months, when the stools might be constipated, though often said to be soft; sometimes there was almost continuous diarrhoea for months, occasionally for a year, but this followed shorter spells of looseness of the bowels. When the diarrhoea was severe, the motions might occur at any time of the day or night, though in eighteen of the twenty-nine cases, as stated, they occurred mainly or entirely in the early morning or after meals.

Condition of the mouth: in four cases, the teeth and gums were noted as above suspicion; in the majority, the teeth were bad, or there was a history of bad teeth, extracted prior to the first examination. Other infections: In four, severe anaemia of the pernicious type was present, and in one case, a mild tubercular infection of the lungs, not regarded however by the specialist as having any bearing on the diarrhoea.

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*Delivered before the Winnipeg Medical Society, October 20th, 1922.

The general health was usually good, apart from the pernicious anaemia group, though many complained of tiring too easily and of lack of "pep", and in seven of these, there was moderate or even severe secondary anaemia; *e.g.* in one case, red blood cells were 5,360,000 with 65% haemoglobin, and 9,600 whites, while in another, the red cells were 3,400,000 with 50% haemoglobin, and 10,800, whites. Gastric symptoms were not prominent; a few complained of gas and fullness in the epigastrium or left hypochondrium after food; in two, occasional vomiting.

Gastric contents: Test breakfasts were given to all; in many, this was repeated at varying intervals, and in a few, test dinners were also given; fractional gastric tests were not made in these private cases, but in similar cases, met with in the public wards of the hospital, fractional tests simply confirmed the ordinary tests. The amount recovered from the stomach was usually small, a few teaspoonfuls to a few ounces; the bread was generally poorly digested, often quite coarse particles blocking the stomach tube and making aspiration difficult; in several cases so little was obtained that a second test breakfast was necessary to complete the examination. In all cases, free hydrochloric acid was absent (some cases with subacidity with similar symptoms are excluded from this paper); blue litmus paper was unchanged in 10, while in the others, the total acidity varied from 0 to 16, except in one case, where it reached 32; lactic acid was present in 2; occasionally there was considerable mucus intimately mixed with the food remnants; there was no pus but traces of bright blood were repeatedly seen, evidently from traumatism by the stomach tube. No examination was made of the gastric ferments or of the stools.

It will be objected with apparent reason that the absence of fractional gastric tests, of ferment and stool examination makes the record of these cases very imperfect, but my excuse for the paper lies in the satisfactory treatment of this type of diarrhoea—a treatment which has not yet passed into general use. Thus in only three of the twenty-nine cases had test breakfasts been given prior to my examination; a sufficient commentary on the need for further emphasis of the condition.

Aetiology of the anacidity—The presence of much mucus intimately mixed with the gastric contents indicated in a few cases a chronic gastritis for which poor teeth and infected gums were possibly responsible; pernicious anaemia was associated only in four cases, but for the great majority, no cause for the gastric anacidity could be determined though some cases were followed for many years with no hint of the development of anaemia or its tongue and spinal cord complications.

The cause of the chronic diarrhoea itself is less obscure: the complete absence of hydrochloric acid in the stomach prevents the preliminary digestion there of proteins and of the cellulose enclosing vegetables and even bread; it allows this poorly broken up material to pass more rapidly into the intestine by the breakdown of the normal pyloric reflex controlled as this should be by free hydrochloric acid; it interferes with the normal stimulus to the pancreatic secretion, and to the flow of bile, excited as these are by the presence of acid in the duodenum (though both secretions have been shown to pour into the bowel even in the absence of the usual stimulus) and lastly the disinfectant influence of hydrochloric acid is absent, allowing of the readier passage of infective material into the bowel. The intestines therefore have more work to do; in many cases, full compensation is maintained and the individual is quite healthy, but with a narrower margin of safety; carelessness in diet, infective material taken with the food, nervous excitement, and chilling of the body, throw additional work on the bowel; functional disorders of the intestine develop—sometimes actual catarrhal conditions follow with accompanying diarrhoea.

The treatment of gastrogenic diarrhoea was satisfactory in the cases which could be followed for a sufficient time—sometimes for many years—to admit of a definite opinion. In severe cases the patients were kept in bed for a few days to a week, but in the majority, this rest treatment was not necessary. The mouth was carefully freed from sepsis, a dentist's co-operation being insisted on where necessary, to treat infected teeth and gums, and to secure serviceable dentures. The diet varied somewhat in the individual case, but thorough mastication was suggested in every case; coarse vegetables and raw fruit were excluded from the diet, along with condiments, raw milk, underdone, tough, and smoked meats. Milk soups, crisp toast, butter, well cooked cereals, soft-boiled eggs, tender meat especially boiled and minced, chicken, whitefish and pickerel, purees of vegetables could usually be taken, and fruit juices or cooked fruits without skins and seeds; baked potatoes, cauliflower, squash, and vegetable marrow could generally be added soon. In some cases from the country, the water used seemed to be a factor, and weak tea was substituted. Chilling of the abdomen was especially guarded against.

Medicinally, dilute hydrochloric acid in doses of fifteen to thirty drops before or with meals, diluted by the patient with sufficient water to make it palatable was used, and in many cases, found to be almost specific. The value of hydrochloric acid in these cases is not sufficiently recognised by the profession, though Leo and many others in Germany and quite recently VanderHoof in the United States, have urged its use. Many of the patients have taken the acid for years, sometimes almost continuously, sometimes only at intervals when a recurrence of diarrhoea threatened. It was found advisable to order the straight dilute hydrochloric acid along with a dropper; the four or six ounce bottle of acid would last a considerable time, and the patient was instructed to renew it steadily, without the necessity of another consultation, except at long intervals. Further, when the patient understood that he was merely using a little acid to replace a fraction of what was lacking, and that it might be used with advantage over months or years, he was often prepared to use the drug continuously, where a more complex prescription would have been given up. So too, the acid was usually ordered immediately before or with meals, as more convenient for the patient. In a few cases, sixty drops were given with meals, or half an hour or an hour after meals, and were found efficacious, where the smaller dose was ineffectual. There is no doubt of the extraordinary value of this simple treatment in many cases which have resisted all forms of astringent remedies, including opium. Pancreatin used in some of the earlier cases, was given up in favour of hydrochloric acid. In the beginning of treatment, bismuth salicylate gr. 10, three or four times a day was frequently used and the patient was advised to use it later if necessary, for a short time, in case of a relapse. In the most severe cases, an enema of two ounces of thin starch solution with ten or fifteen drops of laudanum was used occasionally at the beginning of treatment, combined with rest in bed.

It has been objected with perfect truth, that thirty or sixty drops of dilute hydrochloric acid given with each meal represents but a negligible quantity, compared to the huge amount poured out by a healthy stomach in response even to a small meal; the success of these tiny doses however, will in many cases brush aside any theoretical objections to their use.

It must be noted that thirty-one of sixty cases of anacidity were not attended by diarrhoea; four of these had quite indefinite symptoms, while two (men of sixty-four and fifty-four) complained of spells of severe bloating and distention coming on from 4 to 5 p.m., and lasting till bedtime, with eructation of gas and even vomiting; in both cases there had been marked loss of weight (forty and twenty pounds) so that malignancy was suspected; gastro-intestinal x-ray examinations were negative; the test meals gave a small quantity of coarse food particles, with blue litmus paper unchanged. Both cases responded in an extraordinary way to dilute hydrochloric acid, and were well when seen one and two years afterwards.

II. The remaining twenty-five cases of gastric anacidity were suffering from pernicious anaemia. Of these fourteen were females and eleven males; no Jews were seen with the complaint, and enquiry of several busy practitioners, including Dr. Bercovitch, and some slight study of the Winnipeg General Hospital records, made by Dr. Goodwin has failed to bring a single case of pernicious anaemia among the Jews to light. This seems to me a very remarkable fact, worthy of some consideration and investigation, in view of the great prevalence of pernicious anaemia in Winnipeg and the prairie provinces generally. The exemption of the Jewish race from this disease can hardly, however, be general, for no note is made on the subject in the monumental *System of Medicine* edited by Kraus and Brugsch, or in the recently published *Oxford* or *Nelson Systems*, while Cabot expressly states that race does not affect the liability to pernicious anaemia. Recently Levine and Ladd have pointed out that pernicious anaemia is less common in immigrants from Russia, Italy, and Eastern Europe.

It should be noted that all observers are agreed that gastric anacidity is present in practically every case of pernicious anaemia from its earliest recognition and through its entire course till death. In doubtful cases, one may with advantage utilise the presence of free hydrochloric acid in the stomach contents to exclude the possibility of pernicious anaemia. In the twenty-five cases of anacidity with pernicious anaemia, nine presented no unusual symptoms save that in one, free hydrochloric acid was found to be absent in the gastric contents two years before any blood changes were found, and that another, a woman of middle age, whose red cell count was 2,250,000. haemoglobin 55% with marked variation in the size and shape of the red cells, gave a history of having been diagnosed pernicious anaemia ten or eleven years previously by a prominent Montreal physician, and of suffering for all these years from the disease. Eight of the number presented marked mouth symptoms, while the remaining eight complained bitterly of sensory or motor symptoms in the extremities.

A little closer study is offered of these two groups with tongue and spinal cord symptoms, because these troubles may appear early and in fact may dominate the clinical picture before any characteristic blood changes appear.

(a) The tongue disorders have been emphasised for many years by William Hunter, of London, who now would confine pernicious anaemia, or "glossitic" anaemia as he calls it, to cases of anaemia with the tongue symptoms. Hunter holds that glossitic anaemia is usually complicated and greatly aggravated by septic anaemia from infected teeth and gums; other severe anaemias without mouth symptoms are regarded by him as septic anaemias, apparently regardless of the exact blood picture. In so narrowing the definition of pernicious anaemia, Hunter stands alone, especially when he claims that his narrowed group of glossitic anaemia is dependent on excessive blood destruction, while the remaining anaemias owe their character to deficient blood formation.

Minot in the *Oxford System* estimates that fully 45% of pernicious anaemia cases have disagreeable sensations referable to the mouth, while Brugsch, in Kraus and Brugsch's *System* says the "Hunter" tongue is very important but seldom found.

Of the eight cases with mouth symptoms, seven were females and five occurred between the ages of fifty and sixty. The complaints were soreness, burning and scalding at the tip and sides of the anterior half of the tongue, lasting sometimes a few days, sometimes a few weeks, and recurring irregularly possibly for two or three years. The seasonal time of onset and recurrence (July to September) noted by William Hunter was unfortunately not specially investigated. In the attacks, the tip and edges of the tongue looked raw and deep red in patches, as if the epithelium had been freshly stripped off; small vesicles often appeared in the attack, especially on the under edge of the tongue. The mucous membrane of the lower lip was sometimes affected; in one case, the dorsum of the tongue suffered also, while in another, the burning extended to the throat, and in a third, from the tongue and throat downwards to behind the end of the sternum.

In the intervals, the tongue was noted in two cases to have an atrophic, smoothed out appearance, but this sequela was certainly not present in all cases, even with a long standing history. In three cases, burning of the tongue preceded any definite symptoms of anaemia by one to two years; the symptoms could be produced in two cases by eating tomatoes, and in another, by candies or raw fruit, while another patient, who had suffered severely for two years, was very greatly improved though not cured, a year prior to my examination, by having many infected teeth removed.

As a general rule, the tongue symptoms lessened in severity as the anaemia progressed, possibly due, as above, to the removal of accompanying septic foci in the mouth. I have noted no scarring or white atrophic patches as the result of the glossitis, which is apparently too superficial to cause the changes. There is, I think, another chronic tongue condition of which I have seen three or four examples, associated with scarring and white atrophic patches mainly along the sides of the tongue; the condition is painful and recurs for years; its origin I do not know but it is distinct from the ordinary secondary or tertiary manifestations of syphilis, and the Wassermann in two cases was negative.

While every case of frequently recurring soreness and burning of the tip and edges of the tongue must be viewed with anxiety and carefully watched from the pernicious anaemia standpoint, I must record the case of a married woman of fifty-seven whom I first saw in 1914, complaining for six months of soreness of the tip and sides of the tongue, with burning more or less all the time; in April 1922, she again appeared, the tongue symptoms having continued off and on during the eight years; no objective changes were present in the mouth; the red blood count was 4,960,000, haemoglobin 70%, with 6,400 whites, while a test breakfast gave free hydrochloric acid within normal limits. A similar case, with marked tongue symptoms for six years with moderate secondary anaemia and free hydrochloric acid in the gastric contents, is now under my care.

(b) Turning now to the eight cases with marked spinal cord symptoms, occurring comparatively early in the disease; five were males, while six of the eight occurred in persons over sixty. The greater tendency for the appearance of spinal cord symptoms in people beyond middle age has been emphasised by all observers; the condition is very prevalent in the West, and is apparently much more frequently met with than ten or fifteen years ago. I have seen both in consultation and in hospital practice a very considerable number, not included in these office cases.

The patients complained of numbness and "pins and needles", sometimes also of coldness in the extremities, beginning usually in the feet and hands and extending upwards in the course of weeks or months so that the lower trunk becomes involved. In two cases, however, the numbness started on the front of the thighs and only in the course of months reached the feet; though usually bilateral, the condition is often more marked on one side. The numbness and tingling is most trying to the patients, sometimes disturbing their sleep. Clumsiness, *e.g.*, in needlework or in handling cards is early complained of; weakness too appears, so that the patient tires readily in walking. In two instances, weakness of the legs was first noticed in going upstairs, combined with slight unsteadiness, which in one case amounted to a definite ataxia. At first, these subjective sensations are not accompanied by definite objective sensory changes; soon touch does not "feel natural"; changes in the appreciation of pain and temperature are as a rule earlier demonstrable than changes in tactile sense; the sense of position of the toes may be affected early. The knee jerks are usually exaggerated, though in the case with definite ataxia, they were lost when first seen only three months after the onset of symptoms. The sole response may be flexor and may remain so for months, ultimately becoming extensor, often on one side only at first. A girdle sensation was present in two cases, and extensive vitiligo was present twice. The cord symptoms may antedate all obvious blood changes by months, even by a year or more. Thus one patient suffered for almost two years from tingling and numbness in the hands with slight weakness before he went South, where the appendix was removed for vague digestive disturbances; a note from the South stated that "the red blood cells were 3,420,000, haemoglobin 80%, blood otherwise normal; slight evidence of some cord condition, not marked enough to make a definite diagnosis." After the operation the cord symptoms and anaemia developed rapidly, the patient dying in less than a year from the time of operation.

Another patient complained bitterly of numbness, tingling and weakness of the limbs for five to six months, before obvious changes occurred in the blood and even then, the red cells amounted to 3,900,000, haemoglobin 70% and whites 9,200, with distinct anisocytosis; a year later, the typical blood picture was, however, present.

In still another patient, at a time when the ataxia and weakness had developed so far that the patient could not stand, the red cells were 3,190,000, with no marked change in the microscopic picture, haemoglobin 82% and whites 7,000; this patient died six months later, with a typical blood picture. It is thus obvious that the nervous symptoms depend not on the degree of anaemia present but on the presence of the unknown toxin, which causes at once the cord symptoms and the anaemia, sometimes concomitantly but sometimes independently of each other, though in general, the anaemia is present for some time before any nervous symptoms develop.

It is unfortunately true that these spinal cord symptoms improve little if at all, even with a marked remission of the disease otherwise, whether brought about spontaneously, medicinally or by transfusion. They depend on degenerative changes in the white matter of the spinal cord, at first and mainly in the posterior and lateral columns, usually of the dorsal region, though later involving practically the whole of the white matter, with some later degeneration of the peripheral nerves and changes in the cells of Clarke's Column. Orr and Rows have shown that a similar degeneration can be procured by the local action of bacterial products upon the spinal cord. In the diagnosis of postero-lateral sclerosis, the persistent and troublesome numbness and tingling of the extremities with later objective sensory loss help to distinguish the condition from disseminated sclerosis, while the appearance of an extensor response, in the ataxic type with absent knee jerks, would turn the diagnosis from locomotor ataxia.

It would exceed the scope of this paper to go far into the question of the blood change proper in pernicious anaemia. It may be pointed out, however, that while a jaundiced colour of the blood plasma, a reduced haemoglobin and red cell count, a high colour index, leucopenia with relative lymphocyte increase, diminished platelets and especially the presence of many large deeply staining red blood cells with some large oval forms and occasional large nucleated reds represent the typical blood picture of pernicious anaemia, yet in the beginning and in the remissions, simple secondary anaemia or even normal blood findings may be present, save possibly for the occasional presence of unusually large, sometimes oval, red blood cells. This caution is the more necessary since twice I have seen patients, who in marked remissions were assured by physicians that the former diagnosis must be incorrect; an assurance leading naturally to the resumption by the patients of their old activities, with disastrous consequences.

After all, it must be remembered, pernicious anaemia is a disease of unknown origin, with symptoms and clinical course more or less characteristic; the yellowish grape-fruit appearance of the skin, the increasing weakness in the absence of obvious explanation apart from the blood picture, the almost constant gastric anacidity, the frequent symptoms in the mouth and in the spinal cord, the increased excretion of urobilin, the downward course generally arrested by periods of remission of varying length, form a syndrome which even with an atypical blood picture demands the diagnosis of pernicious anaemia.

On the other hand, an absolutely typical blood picture of pernicious anaemia may be found in Bothriocephalus Latus infection, in lymphatic aleucaemia, occasionally in the bony metastases of carcinoma and in pyrodin poisoning.

Thus we see that in the diagnosis of pernicious anaemia, the clinician must be the final court of appeal, in the face of varying laboratory findings.

ACRODYNIA (?) A REPORT OF THREE CASES IN RURAL PRACTICE*

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Alliston

SEVERAL years ago I attended three children each having a similar group of symptoms, quite different from any that I have seen before or since. Until recently I was not aware of any description in text book or journal that would enable me to associate these cases with any observed by others. In July, of 1921, I noticed a short article in a medical journal[1] entitled "A Case of Acrodynia" and a glance through it reminded me of the three cases I had attended years ago. Our great English poet asks—"What's in a name?" We of the medical fraternity generally feel happier and are better able to satisfy the demands of the patient and his friends if we are able to attach a name to any case of sickness and thus arrive at what is ordinarily termed a diagnosis. Etymologically the term "acrodynia" means painful extremities. I cannot find the word in any of the recent text books in my library nor in the indices of any of the *Medical Annuals* for the seventeen years extending from 1905 to 1921. In the recently issued 1922 volume however, there is a short article on acrodynia. In the same volume there is another article under the heading "erythroedema". This appears to be an entirely new word and was apparently coined by Swift to designate a number of cases, observed in Australia, which appear to be similar in nature to the cases observed on this continent and described under the name of acrodynia. Acrodynia is not a new word. Dunglinsons' Medical Dictionary published nearly fifty years ago, gives the following definition;—"A painful affection of the wrists and ankles, especially with an erythematous eruption which appeared in Paris in 1828-29. It appears to have *been the same as Dengue.*"

In the dermatological volume of *Morrow's System of Genito-urinary Diseases, Syphilology and Dermatology* published in 1894, a whole page is given to acrodynia otherwise termed epidemic erythema and cheiropodalgia and it is there defined as an acute epidemic and general disease attended with disorders of the nervous system. It is especially characterized by pains in the extremities and an erythematous rash on the skin followed by thickening of the epidermis, desquamation and pigmentation. It has been observed most frequently in the east but also occasionally in Europe. As will be pointed out later on there is some difficulty in identifying the cases recently reported as acrodynia with the description given in Morrow's System and the accounts we have of the Paris epidemic.

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*Read at the annual meeting of the Ontario Medical Association, May, 1922.

The following description of the cases observed by myself is prepared from notes taken at the time of my attendance.

Case I.—Mary N., aged 5 years: I was called to see her on February 14th, 1899. The child had always been considered by her parents to be somewhat nervous. About three months previously she had been troubled with frequent and scanty micturition. A dose of worm medicine was given by the parents which caused expulsion of some worms and the urinary trouble ceased. About a month previous to my seeing her she had an attack of what the mother thought was "Grippe", the other children in the family being affected in the same way. The principal symptom connected with this attack was vomiting. After getting over this she appeared to improve for a while. She then began to complain of abdominal pains and these continued for about two weeks before I was consulted; these abdominal pains, associated with constipation, some retraction of the abdominal muscles, loss of appetite and general irritability appeared to be the principal symptoms at my first visit. Shortly after this the abdominal pains became less, and she began to complain of coldness of the extremities followed by itching, or as the mother thought tingling pains, first in the lower and then in the upper extremities. The child was irritable and cried when she was touched. There appeared also to be real pains first in the muscles and then in the joints but no redness nor swelling of the latter could be noted. The child was very weak but had no actual paralysis. The urine was scanty and acid. No albumen. The patient took very little nourishment. *About two weeks* after my first visit a roseolous rash was noticed on the hands and feet which were slightly swollen and felt cold to the touch. The mother said that a couple of days previously the back was covered with a somewhat similar rash. Tongue coated. T 99° P. 130; abdomen still retracted; patellar tendon reflex appears to be absent but owing to the child's unwillingness to be examined it was difficult to be sure of this. *One month* after my first visit the symptoms appeared about the same excepting that a few days previously the left ear began to discharge after some days of earache. Hands and feet were still swollen and itchy. Rash fainter, P. 120. Mother thinks she is not quite so irritable since the ear began to discharge. *Six weeks* after first visit. Patient takes very little nourishment and has got very thin. Passed one worm about a week ago and about the same time developed a cough. Hands and feet desquamating with quite large pieces in some spots, very much as after scarlet fever. There is a sore on the upper lip resembling a boil. Apart from the itching not much complaint is made of pains. Bowels inclined to be loose lately. *Seven weeks* after first visit. Patient is eating better and apparently gaining in weight. Tongue clean. Feet and hands do not appear to be so congested but pustules are present on some of the fingers and toes. Cough is much better. Pustule on lip is better. Ear suppurated again a few days ago but this appeared to be from the external auditory canal only. *Ten weeks* after first visit. Patient now sits up part of the day and rests well at night. Appetite good. Bowels regular. Toes and fingers nearly all healed. One finger still has a pustule. *Ten months* after my first visit the following note was entered in my case book and was written after I had been called to Case No. II and recognized the similarity of symptoms—"Patient gradually improved and got entirely well. The redness of the extremities while at the same time they felt cold to the touch was a symptom noticed by the mother early in the disease. A peculiar frowning expression with avoidance of light was another symptom."

Case No. II.—Kate H., aged 4 years, was first visited by me November 27th, 1899. Patient had been ailing for about two weeks with abdominal pains, restlessness and general nervous irritability. Her mother gave her worm medicine which caused the passage of some worms but symptoms did not improve. When I first saw her there was photophobia, the patient keeping the eyes almost constantly shut and away from the light. My attention was not specially called to the condition of the hands and feet at my first visit but there was a fine papular rash on the face and body. About a week after, however, the hands and feet were noticed to be rosy red in colour but cold to the touch. The urine was thick with urates. At my first visit some worm powders were left and two were given and one or two round worms were passed. *Seventeen days* after first visit, child was able to walk but with a peculiar stiff and waddling gait; has a peculiar frowning expression but is not so intolerant of light as at my first visit. Vesicles were beginning to appear on the fingers and the child is constantly working with these. A fine rash was still present on the body; in some places the skin was broken owing to scratching. Two days later the father reported that blisters and sores were forming on the fingers and toes. The temperature of the body was 99°. *Three weeks* after the first visit, the patient was quieter during the day, but no better at night. Complained greatly of itching and a constant desire to micturate. Her appetite was better. The spots on the hands were no worse and the hands were not so cold or red. The child appeared also to be walking better. *Seven weeks* after my first visit, the child appeared better in most respects but was still very restless at night. She was now gaining in flesh. Her mother informed me that she had been in the habit of giving the patient a worm candy about once a week for the past year; she thought that the child's desire to micturate so frequently at night was merely an excuse on the part of the patient to relieve the itching by placing her feet on the cold floor. *Eleven weeks* after first visit the child was reported to be much better. For some nights she had not had to take anything to produce sleep. *Six months* after first visit I saw the patient in my office. She appeared to be fully recovered. The father informed me that the nails of all the fingers and toes came off.

Case III.—Baby M., aged 7 months, female: I was called to see this baby on March 18th, 1901. She had then been ill for about three weeks, very restless, tossing herself around and not sleeping for more than a few minutes at a time. The bowels were constipated. Erythematous spots appeared on various parts of the body. The hands and feet were of a rosy red colour but cold to the touch. The child had pneumonia when three months old and the mother thinks the extremities have been more or less like this since that time. The child has a peculiar frowning expression. *Two weeks* after first visit. Child about the same but mother thinks it rests a little better at night on account of the sedative given. *Three weeks* after my first visit there was not much improvement. Appetite was very poor and bowels were constipated; hands appear about the same; spots still come and go on the body, but not so much so as before. Pulse rapid.

This is the last note I have on this case but shortly after, the patient began to improve and made a good recovery but continued to be a somewhat nervous child. This was a comparatively mild case and had it not been for the other two might easily have been forgotten by me.

I wish to report these cases for the following reasons:

(1) They appear to me to belong to a similar group of cases as those recently reported by different observers including Weston[2] and Byfield[3] in the United States, Brown[4] in Canada, Swift and Wood[5] in Australia.

(2) These cases were observed in country practice showing that whatever the cause of the trouble it is not confined to city children.

(3) They were observed over twenty years ago showing that the cause or causes of the trouble do not pertain exclusively to recent years.

The onset and progress of the disease may be defined as subacute rather than acute, and the average duration three months or longer. The principal symptoms noted in connection with my cases were as follows: (1) Abdominal pains with constipation. (2) General nervous irritability and insomnia due to or accompanied by disagreeable sensations of some sort in the extremities and described by the first two patients as itching. (3) Erythemas of various kinds. (4) Photophobia which according to my recollection was not due to nor accompanied by conjunctivitis such as we see in measles. (5) Loss of appetite, wasting and general weakness without actual paralysis. (6) Absence of tendon reflex noted in one case. (7) Frequency of micturition. (8) A peculiar stiff gait in walking. (9) Very slight fever while the cases were under my observation but fever may have been higher at outset. (10) Pulse inclined to be rapid. (12) Discharge from ear and bronchial trouble in one case. (12) The nails of fingers and toes fell off in one case.

Practically all of these symptoms in various combinations and degrees of severity have been noted by the other observers mentioned. Some symptoms observed by others but not noted by me are: (1) Profuse mucopurulent naso-pharyngeal discharge. (2) Profuse perspiration. (3) Falling out of teeth and hair. (4) Acetone in the urine. (5) Leucocytosis. The essential symptoms of the disease would appear to be: (1) Subacute onset and course. (2) General nervous irritability with paresthesia of the extremities. (3) Erythema.

What is the nature of these cases? Is it a specific disease or may a similar group of symptoms be caused by different agencies? Is this group of symptoms peculiar to young children or have any cases been recently described as occurring in adults? Are we justified in appropriating the name acrodynia to designate these cases when that word was used a century ago as the name for an epidemic disease affecting large numbers most of whom were presumably adults. Moreover, conjunctivitis is spoken of as a prominent symptom in the originally described acrodynia. Although in these recently described cases in young children photophobia is mentioned as a symptom it does not appear, as a rule, to be associated with conjunctivitis. Can a similar group of symptoms be produced by chemical poisoning? In the year 1900, there was in England[6] a veritable epidemic of arsenical poisoning which was traced to the drinking of contaminated beer. Many of these cases presented symptoms very similar to the cases we are now considering but in some features, particularly as regards the conjunctivitis, more resembling acrodynia, as observed a century ago. Indeed it is difficult to resist the suspicion, that some of the epidemics mentioned by Weston[2] in his paper may have been due to wholesale arsenical poisoning. With regard to my own cases, particularly the first two, I thought at the time that possibly the toxaemia due to the presence of worms and the frequent administration of santonin for their expulsion may have been contributary factors in the etiology. Some have thought that these cases were varieties of pellagra. I shall not attempt to enumerate the various points of difference. The skin lesions of pellagra are said to have sharply defined borders. This was not so with the cases now under consideration. Finally what about influenza? My cases were observed ten years after the severe epidemic of 1889-90; but for a good many years after the epidemic we had occasional outbreaks and sporadic cases, and "grippe" was held responsible, in some cases no doubt correctly, but in others probably erroneously, for a good many things we could not otherwise explain. Most writers seem to think there is a close relation between cases of acrodynia and influenza.

Diagnosis in the early stage of these cases may be difficult. In my first case on account of the general nervous irritability, photophobia, constipation and retracted abdomen I was for a time apprehensive that I might be dealing with the premonitory symptoms of tuberculous meningitis. The diagnosis finally arrived at was some form of neuritis. The fully developed and well marked case is however so peculiar that I think it will, as a rule, be recognized by a practitioner, who has seen or read of other cases. Isolated mild cases might be overlooked.

Prognosis. This is generally said to be good. The mortality however according to the statistics available at present appears to be about 7%, most of the deaths being due to a complicating broncho-pneumonia.

Treatment. As one writer puts it these are miserable cases to deal with and the knowledge and skill both medical and diplomatic of the practitioner will be severely tested not only in the attempt to alleviate the sufferings of the patient but to satisfy the relatives while nature is working out a cure. In the absence of exact knowledge as to etiology, the treatment must be largely symptomatic. The maintenance of nutrition and the administration of tonics and sedatives are probably the main things requiring attention. If there be reason to suspect the presence of intestinal parasites these should be got rid of as speedily and effectually as possible. In these days of filterable viruses and imponderable vitamines it is possible that we may treat too lightly the potency for evil of such vulgarly macroscopic agencies as common worms.

In my cases laxatives, small doses of arsenic and iron and cod liver oil were given. If I had another case I think I would try calcium lactate as a general tonic and nerve sedative. Chloretone given at bed time was thought by the parents to have been of some use in relieving the nocturnal restlessness. Atropine has been used for excessive perspiration. Removal of tonsils and adenoids and drainage of the accessory nasal sinuses has been done in some cases with apparent benefit. Inasmuch as broncho-pneumonia is only too apt to follow such operations when performed on fairly healthy individuals and as this is the complication most likely to cause death in acrodynia these operations should not be lightly undertaken. Such a happy combination as favourable surroundings, a wise pediatrician, a skilful operator and a thoroughly competent anaesthetist might justify a procedure that would be better let alone by the general practitioner.

Conclusion: A number of cases of sickness in young children have recently been reported in different parts of the world by various observers. The symptoms of these cases are sufficiently uniform and characteristic to justify grouping them together for purposes of comparison and study. Until more is known of the etiology and pathology "acrodynia" appears to be a convenient and appropriate term to apply to these cases which may or may not be of the same nature as the epidemic disease which under the same name occurred in Paris one hundred years ago and is said to have occurred frequently in eastern countries. It is quite likely that other Canadian general practitioners in both city and country have seen such cases but did not know what to call them. Until more is known of their nature it would seem desirable that even individual cases should be reported, special attention being paid to any or all possible etiological factors.

References

(1) Emerson, *Jour. Am. Med. Assn.*, 1921, Vol. 77, p. 285. (2) Weston, *Archives Pediatrics*, Sept. 1920. (3) Byfield, *Am. Jour. Dis. Child*, Nov. 1920. Illustrated. (4) Brown et al, *Archives Pediatrics*, Oct. 1921. (5) *Medical Annual*, 1922, p. 149. (6) *Medical Annual* 1902, and various numbers *Br. Med. Jour.* 1900.

Desperate Risk Goitre.—This report is based on 1,000 cases selected from a series of 1,318 records of recent cases, under observation since May 31st, 1914. In the opinion of Martin B. Tinker, Ithaca, N.Y., any case in which the patient is apparently faced with almost certain death unless relieved within a relatively short time might be classed as a desperate risk. Forty-two patients died without operation, either while under observation in the hospital or at their homes. The causes of death in these cases may be grouped as follows: hyperthyroidism with extreme toxaemia; hyperthyroidism in association with diabetes; goitre with extremely high blood pressure; goitre causing death by obstruction to breathing, and thyroid malignancy. In Tinker's experience with the hyperthyroid cases, those patients with obstinate gastro-intestinal symptoms, very high blood pressure and myocardial insufficiency have seemed especially desperate risks. When nausea and vomiting or diarrhoea have apparently resulted from thyroid toxaemia alone, uninfluenced by diet, medication or other causes, and have persisted in spite of treatment, the patients, without exception, have died. Hypertension in combination with hyperthyroidism has also proved of decided gravity. He has considered as not suitable for operation any patient whose blood pressure has not dropped at least thirty points, nor has he operated on any patient with a blood pressure of more than 190, and generally the pressure has dropped to 170, or lower. These patients are most safely operated on under local anaesthesia. Myocardial insufficiency, whether from poisoning of heart muscle or because of weakening from long continued tachycardia, also puts some patients in the desperate risk class. Among the hyperthyroid cases are many patients without gastro-intestinal symptoms, extreme hypertension or pulse deficiency that directs attention to the gravity of their condition, but who, because of extreme toxaemias, are in desperate condition. In these cases the extreme unrest, tremor, insomnia, emaciation, dyspnoea, edema and very rapid heart—most, or all, of these symptoms—are sufficient indication of the gravity of the condition.—*Jour. Am. Med. Assoc.*, October 14th, 1922.

Vitamins in Ice Cream.—Vitamin A was present in the typical samples of ice cream examined by Arthur H. Smith, New Haven, Conn. in such concentration that he concludes that no noteworthy alteration in its potency is caused by pasteurizing or freezing. Normal growth was induced by 1 gm. of the ice cream, and ophthalmia was cured by 0.25 gm. containing 25 mg. of butter fat. The vitamin B of the ice cream can be accounted for by the equivalent quantity of milk used therein. Freezing had no effect on the vitamin B in the ice cream used. The ice cream, which was made from pasteurized products, contained no significant quantity of vitamin C.—Jour. A.M.A., December 30th, 1922.

Ocular Manifestations of the Rat Which Result from Deficiency of Vitamin A in the Diet.—It is the impression of Arthur M. Yudkin, New Haven, Conn., that, from a clinical standpoint, the incipient changes in the eyes of rats showing nutritive disturbances on diets deficient in vitamin A are like the condition known as xerosis of the conjunctiva and cornea in man; and the more advanced picture is that of keratomalacia.—Jour. Am. Med. Assoc., December 30th, 1922.

Case Reports

ECHINOCOCCUS CYSTS OF THE LIVER IN A GIRL TEN YEARS OLD

H. Maitland Young, M.D.

R. M.—(M.G.H. 395-22), a school girl ten years of age, was admitted to the surgical service of Dr. A. T. Bazin, on January 22nd, 1922, complaining of pain in the right hypochondrium, vomiting and fever.

Previous History: She came to Canada at the age of two years, from Southern Russia. An attack of four days duration, characterized by abdominal pain and vomiting occurred in November, 1921, and was the only attack of similar nature preceding this one.

Present Illness: The patient awakened at 5 a.m. on the date of admission complaining of pain in the right upper quadrant of her abdomen. She was nauseated and her bowels moved twice. Vomiting occurred on one occasion only, following a dose of paregoric. She felt chilly but there were no definite rigors. No urinary symptoms were present. The family history was irrelevant.

Examination: On admission her temperature was 101.6, pulse 136, respirations 30. Her complexion was sallow. She was able to turn on either side without distress but on deep inspiration she complained of pain in the right lower axilla. Physical examination of her heart and lungs showed no evidence of organic involvement. There was slight prominence of the right hypochondrium and epigastrium. Muscular resistance was present in these regions. A mass which closely resembled the liver extended four fingerbreadths below the costal margin on the right side. Its lower margin was quite tender, and the area overlying the mass was flat on percussion. There was no evidence of free fluid and the costo-vertebral angle was free. Rectal examination revealed nothing abnormal. Urinalysis was normal and the leucocyte count was 14,000 per per cubic millimeter.

Treatment: The Fowler position with the patient under close observation was adopted until the following day when the leucocyte count rose to 19,000. A tentative diagnosis of acute cholelcystitis was then made and an operation was undertaken. The caecum, appendix, stomach and duodenum were all found normal. The liver was much enlarged and corresponded with the mass previously noted. The gall-bladder was distended, tense and oedematous but was easily emptied. A larger mass, the size of a grapefruit showed at the surface of the liver through a cleft in the liver substance three inches long and three-quarters of an inch wide in the right lobe. A smaller one lay in the quadrate lobe and was about the size of an orange. The portions of cyst wall presenting through the clefts in the liver were of a dull grayish white colour and nodular, like walrus hide. Each in turn was aspirated, a clear fluid containing flakes being obtained. The walls of the cysts were then incised and the endo-cysts dissected free and removed intact. The cavities were packed with gauze. Following the operation a differential blood count showed;—Polynuclears, 89%; lymphocytes, 8%; eosinophiles, 2%; transitionals, 1%. Pathological examination proved the cysts to be due to the echinococcus. All cultures taken at operation were sterile. On February 12th, an attack of acute follicular tonsilitis developed."

February 16th.: "When ready for discharge charge yesterday the patient's temperature rose to 104. She complained of abdominal pain, and tenderness about the wound. A small amount of serous discharge oozed from the upper angle of the wound. There was considerable induration around and beneath the wound."

Leucocyte count, 45,000.

February 20th.: Signs of fluid present at left base. 10 c.c. clear amber fluid withdrawn which was sterile on culture.

February 22nd.: "The lower end of the wound broke open and about 400 c.c. of a thin bile stained purulent fluid escaped. The culture showed streptococcus viridans."

March 26th,: "Following rupture, the wound discharged profusely for several days. The temperature gradually fell and for the past four days has been normal. The abdomen is soft throughout and the liver edge is just palpable. She was discharged on this date."

June, 1922: Following discharge from the hospital, the patient was confined to bed with abdominal pain, fever, and increased discharge from the wound for about four weeks. This month, however, the patient is well. She is able to be up all day, eats well, sleeps well and has gained much in weight and colour. The wound has entirely healed and she has no abdominal discomfort.

Discussion: Apparently this echinococcus infection has been present since the child left Russia at the age of two years; but latent except for the abdominal attack in November, 1921. Careful questioning after the operation elicited the fact that the child had never been closely associated with a dog. The pathological diagnosis was made upon the microscopic findings of the laminated endo-cyst wall with hooklets and daughter cysts. In the absence of any infection of the cyst prior to operation it is difficult to explain the elevation of temperature and the leucocytosis. It is well known, however, that escape of cyst contents or absorption without rupture will result in fever, leucocytosis and other evidences of protein absorption such as urticaria. Following upon the attack of tonsillitis there was prompt metastatic infection of the sterile fluid remaining in the incompletely collapsed ecto-cyst cavities. The differential diagnosis was made between appendicitis in a subhepatic position. This was ruled out because of the large size of the mass after only a few hours illness.

Amoebic abscess—The child had never resided in, or passed through the tropics, her birthplace being on the shores of the Black Sea, near Odessa, a climate very similar to that of Canada.

Cholecystitis was diagnosed because of the history of a previous acute abdominal attack lasting four days, the sudden onset with pain, fever, nausea and vomiting together with the finding of an enlargement of the liver and a dull tender mass continuous with its margin and moving with respiration. An echinococcus cyst was not considered. In the past four years there have been but four cases of echinococcus cyst of the liver admitted to this hospital.

Congenital Hypertrophic Pyloric Stenosis and its Treatment by Atropin.—Sidney V. Haas, New York, asserts that the problem in this condition is a medical one, and that atropin is practically a specific. Pyloric stenosis is only an advanced degree of pylorospasm. It is only a single manifestation of a general hypertonic state whose etiologic factor is an overaction of the vagus portion of the autonomic nervous system. There is usually a hyper-excitability of all motor functions. In the treatment, certain points should be observed: Errors in diet or hygiene must be corrected. In every advanced case, saline solution should be given subcutaneously at frequent intervals until enough fluid can be taken by mouth to supply body needs. Atropin, like digitalis, must be active, i.e., freshly prepared from the crystals. Once in solution, deterioration is rapid. In the milder cases, the drug may be given by mouth, in the bottle, or, if the patient is breast fed, in a teaspoonful of water before feeding. In the severe cases, the drug may be administered hypodermically until vomiting is controlled. The dose is variable, 1/1,000 grain (or even 1/2,000 grain, in rare instances) at each feeding to a maximum which either controls symptoms or produces the physiologic effect, i.e., flushing, etc. Beginning with 1/1,000 grain, the amount is increased at each feeding until the result is obtained, when the dose becomes fixed. Treatment may need to be given only a few weeks, or may be required most of the first year. There are rare cases in which much smaller doses are required to begin with. Occasionally, constipation with severe rectal tenesmus results. The omission of a few doses of atropin relieves this.—*Jour. Am. Med. Assoc.*, October 14th, 1922.

Tears of the Tentorium and Falx during Labour.—R. Zimmermann (*Münch. med. Woch.*, 1922, 3) classifies tears of the tentorium and falx produced during labour according as they are infratentorial, supratentorial, or mixed. Two of thirteen cases coming to autopsy were of the first-named group, and the writer believes that the clinical picture corresponding to infratentorial tears is a characteristic one; death of the child ensues immediately after the first respiration, the placental circulation being still intact. Probably the haemorrhage from the tear is insufficient to affect the respiratory centre until reinforced by the circulatory changes following the first respiratory effort.

Retrospect

NITROUS OXIDE

WESLEY BOURNE, M.D.

Montreal

So many reports have recently come to our attention of varying degrees of failures with this anaesthetic agent that it seems opportune to consider the reasons.

The history of this gas is one of periods of use and disuse and always the enthusiasm of its advocates has been as great as that of those who have denounced it. Chemically, it is very feebly reactive and it has been definitely proved that nitrous oxide has no action on any tissue other than that of the central nervous system. After continued inhalation in a pure state and with complete exclusion of oxygen death takes place from asphyxia which does not differ in any respect from that brought about by the shutting out of oxygen by any physical means. This has been shown microscopically for every tissue, evidence of which may be easily obtained by reference to works on advanced pharmacology. Its peculiar action on the central nervous system causing insensibility has not been explained. The margin of anaesthesia between asphyxia on one hand and wakefulness on the other is very narrow. Again, the quality of anaesthesia is very unsatisfactory where this gas is administered under ordinary pressure. Some of the dangers met with in the past have been due to impurities such as traces of chlorine, nitric oxide, hydrazines and hydroxylamines, all of which are very toxic.

All of these difficulties have been gradually overcome with the experience of the past years so that now asphyxia is avoided by combining nitrous oxide with oxygen and it is well established that even the faintest suspicion of cyanosis should not be seen during the course of nitrous oxide anaesthesia. One should bear in mind very strongly, that cyanosis is not a sign of anaesthesia but rather one of a poorly conducted narcosis; this with the exception of a very limited class of cases where saturation is temporarily done in accordance with the method of McKesson. The percentages of the two gases cannot be fixed; even for the same individual and for the same administration they must be varied to suit the colour of the patient, so much so that it is sometimes found necessary to exhibit fifty or more per cent. oxygen to the extremely toxaemic type. This brings us to the question of the narrow margin of anaesthesia, which can be easily maintained for as long a period as may be desired for any operative procedure by the constant and momentary attention to details on the part of the anaesthetist in avoiding cyanosis and in increasing the pressure of the gases in order to insure the diffusion of enough nitrous oxide through the pulmonary alveoli into solution in the blood from which to exert its specific action on the central nervous system. Of the impurities occurring in the manufacture of nitrous oxide, it should be sufficient to point out that practically all concerns supplying this gas are now removing every vestige of these toxic by-products by thoroughly approved chemical methods.

In the technique of administering nitrous oxide a considerable amount of training and experience is necessary to ensure satisfactory results, and among the more important factors may be enumerated the following: A thorough knowledge of the apparatus to be used, and there are many satisfactory ones obtainable; an ample supply of nitrous oxide and oxygen; careful methods of induction of anaesthesia, such as the avoidance of sensations of suffocation; and a complete acquaintance with the signs of anaesthesia, which signs are very definite in the case of nitrous oxide. As may be seen, many other minor features of importance familiar to most of us come under one or other of these.

The use of nitrous oxide as an anaesthetic is steadily increasing and with many is the anaesthetic of choice in all kinds of major surgical procedures. Among obstetricians we see an ever increasing tendency to give preference to nitrous oxide for the relief of labour pains as an analgesic as well as an anaesthetic. With this growth in the frequency with which gas is used, its success will depend upon the employment of persons well trained in the technique of its administration and on their part upon an alertness to avoid cyanosis and to observe the many other minor but important factors.

Editorial

LOUIS PASTEUR

FRANCE never forgets her great men and it is a pleasure to hear that in other countries also the centenary of the birth of Pasteur is being celebrated. We live in a very busy present and are apt to respect the past too little, nor can we realize our present position and how we attained to it unless we look back. Progress in medicine and the allied sciences during the last century was extraordinarily rapid and a glance at the work of Pasteur serves to show the great changes made during the life-time of a single individual, for he was as closely identified with, and as responsible for them, as any man of his age. The lesson of the life can also be learnt.

Born on December 27th, 1822, at Dôle, halfway between Verdun and Besancon, the son of a tanner, Louis Pasteur was educated at the primary school at Salins. He was encouraged by one of his teachers to go to Paris to study for admission to the Ecôle Normale Supérieure where young professors were trained. He was admitted in 1843. The first important studies of Pasteur were in crystallography and concerned with the optically active solutions of tartaric and racemic acid. He showed that crystals of the salts are unsymmetrical and that right or left-handed crystals rotated the plane of polarization to the right or left.

Pasteur took his doctorate in sciences and became first a professor at Dijon and later professor of chemistry at Strassburg. He fell in love with and married the daughter of M. Laurent, the Rector of the Academy there. She was the ideal wife of a scientist whose greatest interest was her husband's work. She sometimes assisted him or acted as his secretary and protected him from needless interruptions. She shared his family joys and sorrows and felt with him and encouraged him midst the difficulties o research.

In 1854, Pasteur was appointed professor of chemistry and Dean of the Faculty of Sciences at Lille. He turned his attention to problems of fermentation, for Lille was a district of distilleries and breweries. One of his most important discoveries was that moulds and yeasts were necessary in the processes of fermentation of beer, milk and vinegar, refuting Liebig's idea that these organisms were present by accident only. This discovery brought Pasteur face to face with the question of spontaneous generation. The results of his experiments convinced many scientists although Pouchet in France, and Bastian in England were opposed to him and held to the old belief in spontaneous generation. Here was an instance of a chemist entering the field of biology and many biologists resented it.

He then returned to Paris, as Director of the Ecôle Normale, where he remained for the rest of his life. In 1865 he investigated silkworm disease on behalf of the minister of agriculture and discovered that the cause was a living organism. By adopting his suggestions, this disease, which was ruining one of the great industries of France, was eradicated. This work of Pasteur's with minute organisms was truly comprehended by Joseph Lister and led to his work on the suppuration of wounds and their treatment with antiseptics. Lister, in the *Lancet* of 1867, wrote in no uncertain terms of the epoch-making researches of Pasteur and later in 1874 in a letter to Pasteur he expressed his gratitude.

Pasteur was closely associated with the great physiologist Claude Bernard and through no seeking of his own was elected to the Academy of Medicine in

1873. Partly by reason of his friendship with Claude Bernard, partly on account of the natural outcome of his work and partly, perhaps, owing to the loss of two children Pasteur turned to the problems of disease which afflict mankind. He discovered the cause of anthrax and the doubting Thomases were silenced when in 1881 at the farmyard of Poilly le Fort the vaccinated sheep showed no disease after inoculation with infected material while the unvaccinated flock succumbed. A like success was achieved with the disease known as chicken cholera; later on he developed still further his method of attenuation of organisms and preventive inoculation. His studies of yellow fever and swine plague made possible the more general acceptance of the germ theory.

His final and crowning achievement was the discovery of a successful method of inoculation to prevent hydrophobia, using at first greatly attenuated virus and then less and less attenuated in the same case. The Pasteur Institute opened in Paris in 1888, and since then others set up all over the world have become fitting monuments to the work of this noble man. Visitors to Paris will admire and not soon forget the painting of the master inoculating his first patient—the little Alsatian Joseph Meister.

Pasteur died in Paris in 1895 at the age of seventy-three. His methods as an investigator, his discoveries, and the details of his saintly life are told as well as could be in Rene Vallery-Radot's *Vie de Pasteur*, Paris, 1900, translated into English by Mrs. Devonshire, (London, Constable, 1911). This book should be in the hands of every medical man and should be read and reread by every young scientist. Recently L. Descour's *Pasteur and his Work* has been put into English dress by A. F. and B. H. Wedd, London, T. Fisher Unwin, 1922.

A NEW FACTOR IN BACTERIOLYSIS—THE BACTERIOPHAGE

UNDOUBTEDLY one of the most interesting developments of recent years in bacteriology is that which has furnished a new point of view on the dissolution or lysis of bacteria through viruses of a hitherto unknown kind which may be and often are associated with or accompany these organisms under conditions which up till a few years ago were supposed to be favourable to their growth. These viruses, or, as they are technically known, lysins, have been found in the normal intestinal contents and they occur there in dysentery, typhoid and paratyphoid A and B and bubonic plague, especially in the convalescent stages of these affections.

These lysins are filter-passers, that is, they are to be found in the filtrates made by subjecting the intestinal contents or excreta to filtration through porous porcelain filters of the Berkefeld type, which holds back all microscopically visible bacteria and other organisms. A drop of a filtrate so obtained for example, from the intestinal contents of a case of dysentery, added to a pure culture of *B. dysenteriae* in a liquid medium will, after five or six hours, cause all the organisms therein to dissolve and disappear. A trace of this dissolved culture then added to a second culture leads to a like result after the same period of incubation, a trace of this second culture so affected inoculated into a third culture acts similarly and so likewise with the *n*th culture. In fact after a thousand of such results in succession the dissolution of the bacteria may be completed at an earlier stage of incubation than was found possible in the first or any earlier inoculations and this indicates that the factor responsible for the dissolution of the bacteria has become more active than it was in the first or any earlier culture of the series. This suggests that the factor is a bacterial form but in a filtrate made through porous porcelain from any one of the cultures in the series there is no visible microscopic form and yet a trace of it is as effective in dissolving the bacteria as is a trace of the dissolved culture from which the filtrate is made. Further if the action is due to a specific chemical substance introduced in the first inoculation it would in the *n*th inoculation be so reduced in amount therein as to be wholly negligible as a factor in explaining the dissolving power it possesses. It is, therefore, not a visible microscopic organism and it cannot be, apparently, a non-living chemical substance, such as a bactericide is.

This lysis was at first known as the d'Herelle "phenomenon" because Dr. F. d'Herelle, of the Pasteur Institute, Paris—who by the way is of French-Canadian origin—was the first to emphasize its importance and significance as he did in 1917 by his interpretation of its causation. Results practically similar to those of d'Herelle were, however, obtained by Dr. F. W. Twort of the Brown Institution, London, in 1914 and 1915 with the micrococci in vaccine lymph, but in his published contribution describing these he offered no explanation of them and consequently the attention they deserved was not given them until 1920, when the extraordinary interest aroused amongst bacteriologists and immunologists by d'Herelle's results brought to general notice those of Twort and the "phenomenon" is now known as the Twort-d'Herelle "phenomenon".

What is the nature of the factor that is concerned in the dissolution or lysis of these bacteria? As already indicated, it is not a visible microscopic organism and, further, it is, apparently, not a non-living chemical complex, for at the thousandth inoculation it is so diluted as to be ineffective bactericidally unless we accept the impossible homeopathic principle that a chemical compound is the more active or potent on living matter the more dilute its solution is. d'Herelle holds that the factor is an ultramicroscopic organism which he has named *Bacteriophagum intestinale*, an organism below the minimal limit of microscopic visibility, which multiplies by division in the intestinal contents as it does in cultures of bacteria. The existence of ultramicroscopic organisms is now generally accepted, they are the causative factors in rabies, measles, common cold, foot and mouth disease, molluscum contagiosum, poliomyelitis, the mosaic disease of tobacco, and trench fever, and it is probable that they are primary factors in the causation of encephalitis lethargica and influenza.

In the extended discussion of these phenomena which took place in the section of microbiology of the British Medical Association at its meeting in Glasgow in July, 1922, in which discussion d'Herelle led, a considerable divergence of view was presented by those who have worked in this field and it may be said that a commonly accepted explanation is still a desideratum. Twort maintained that though the possibility of the lysin in question being an ultramicroscopic organism has not been definitely disproved, on the whole it seems probable but by no means certain that the lytic material is produced by the micro-organisms themselves and he suggests that it may be a product of normal bacteria formed for the purpose of causing lysis of "special forms" amongst them and thus liberating compounds antagonistic to other bacterial species or to neutralize the antitoxins of the infected host, an explanation that is more difficult to accept than that advanced by d'Herelle, for it postulates that in every pure culture there is an early differentiation of the bacteria into groups some of which are destined to be sacrificed for the benefit of the others, a remarkable negation of the struggle for existence in these low forms of life!

Dr. Gratia of the Pasteur Institute of Brussels, who participated in the discussion, holds that the lysin is not necessarily a living organism simply because it reproduces itself, for fire reproduces itself and further one can parallel the reproduction of the lysin by the production, under similar conditions, of the thromboplastic element in the blood plasma. On adding, as he points out, a small quantity of distilled water to stable blood plasma, that of birds for example, a clot results from the setting free of the ferment, thrombin. When now a few drops of the serum from the clotted plasma is added to a second quantity of plasma it also clots, a few drops of the resulting serum added to a third quantity of plasma acts similarly, and so on indefinitely. In answer to this it suffices to say that thrombin, responsible for the coagulation, is not formed in the plasma but is liberated from a mother substance, thrombogen, by a ferment or kinase derived apparently from a constituent of the third corpuscle of the blood through a slight disturbance of the physical and chemical equilibrium of the plasma, caused by the addition of a trace of serum. The parallel, therefore, between the formation of the thromboplastic substances and that of the bacteriophagic substance is quite incomplete. As to the parallel with fire, it may be pointed out that when Pasteur advanced his theory of the causation of fermentation, one of his critics, if we remember rightly, maintained that fermentation started autogenetically and progressed autogenetically like fire. An old argument now with a new application!

Though the views as to the nature of the bacteriophagic element advanced in the discussion were discordant and d'Herelle's received little support, it must be said that on a careful critical reading of the report of the discussion as well as of the original contributions resulting from research on this subject, one is forced to admit that there are more factors in favour of his view than there are in favour of any of the others. It is simpler, less involved, and it does not demand for its acceptance more than what one can reasonably admit. It is much less difficult to believe that the bacteriophagic lysin is an ultramicroscopic organism than it is to suppose that in a pure culture of a bacillar form certain strains of the bacilli are "sacrificed" for the good of the rest, and, moreover, to postulate that a non-living lysin, even though it may be of a highly complex organic nature, can reproduce itself, is to take a long step towards the acceptance of the now wholly discarded doctrine of the spontaneous generation of life. One must, however, before definitely accepting d'Herelle's explanation of the nature of the lysin, await further facts which are likely to be forthcoming soon because the interest which has developed in the subject is certain to attract a great many keen workers into this field of research.

Whatever the final decision may be on this score, it must be recognized that a new aspect is given to bacteriolysis and that some of the doctrines of immunology, now generally accepted, may have to be recast and new explanations of the resistance to disease will then be in order. It is not at all improbable that new lines of treatment may result, especially in bacterial infections of the intestinal tract, the great portal of disease in the body. The Twort-d'Herelle "phenomenon" and the correct explanation of it are, therefore, of transcendent importance in medical science.

A. B. Macallum.

DANGEROUS DRUGS

FROM one who has made a close study of this subject we are told that in Canada and the United States the illicit use of opium, morphine, cocaine and heroin, is becoming an international calamity. Rarely a day passes but one reads in our press of an increasing number of addicts and peddlars who come before our magistrates for offences against the Opium and Drugs Act. For the twelve months ending March 31st, 1922, the Federal Government alone prosecuted twenty-three doctors, eleven druggists, four veterinary surgeons, 165 illicit dealers and 634 Chinamen, making a total of 835 convictions. These figures do not include provincial and municipal convictions. The municipal convictions for Vancouver in 1921 were 858, and in Montreal for the eleven months of 1922, 646. The estimated number of drug addicts in Canada and the United States is 2,000,000.

The drug addict is not content with destroying himself, but has a fiendish desire to promote this addiction among his friends and associates. This, coupled with the enormous profits (from 100%-1,000%) of the peddlar whose business in turn is also to produce addicts, causes those charged with the stamping out of this menace, grave concern.

The Federal Government through its department of health, is able to control the importation of these drugs for legitimate purposes, and its efforts in this direction have been noteworthy. Equally noteworthy, have been its efforts in prosecuting those engaged in smuggling drugs into Canada. It now rests with our provincial governments to study this problem from several angles. They must provide laws and penalties to bridge the gap between our Federal and Provincial jurisdiction. Provision must be made whereby those convicted as addicts may be treated not so much as prisoners, but as people diseased, in the almost forlorn hope that some may be permanently cured, and with the knowledge that in confining the addict they are to some extent preventing the making of others, and certainly suppressing crime, for 85% of narcotic prisoners have criminal records.

Unfortunately drug addicts are not all made by curiosity. Ours is a noble profession, so noble that those of our number who offend in this matter of illicit sale of drugs should be summarily dealt with. The government of the province of Quebec expect to pass at this session legislation that will permit it to cancel the license of any physician or druggist convicted of infractions of the Opium and Drugs Act.

The experience of the clinic recently established and now discontinued in New York City, has conclusively proven that the so called ambulatory or slow reduction method of cure was practically useless. Three thousand addicts registered at this clinic and none were cured. It became a rendezvous for peddlars who found a ready market for their illicit wares when the so called minimum dose was arrived at.

It has on the other hand been demonstrated that the sudden withdrawal method will cure these unfortunates, but until those in control of the Drug Rings, the dealers and peddlars, have been put safely away, a large percentage of those afflicted will surely drift back only to sink lower each time.

At the third assembly of the League of Nations held at Geneva in September 1922, its commission brought in a report on the traffic in opium and dangerous drugs. Many countries have not yet ratified the opium convention of 1912. The commission observes "that as long as the dangerous drugs are produced in quantities exceeding the legitimate requirements, a great danger exists that the surplus will find its way into illegitimate channels. A control of production so as to limit it to the amount required for medical and legitimate purposes will therefore be the most effective way of putting a stop to the illicit traffic." When one considers the amounts that are smuggled into Canada annually, and the almost superhuman methods resorted to by these smugglers, one cannot but feel that a production control is the only hope of abating this new curse that has fallen on the new world so heavily.

A. K. Haywood.

GOITRE

THE symposium on goitre at the Winnipeg meeting and the discussion which it evoked showed a divergence of opinion on the classification, incidence, diagnosis, prevention, and treatment of the non-inflammatory affections of the thyroid gland. On certain aspects of this subject one stands upon the firm ground of proved and demonstrable fact. On other aspects difference of opinion is justifiable because of varying results; while on yet other aspects mature opinion must await the further progress of laboratory experimentation and clinical research.

It would be a distinct advance and a comforting aid to the general practitioner, if the profession would adhere to a uniform nomenclature in classification. We would suggest the following:

(1) Adolescent or endemic goitre:—generally conceded to be a physiological attempt on the part of the thyroid gland to increase its thyroxin output, which, however, in the absence of sufficient iodine, results in colloid storage and tumefaction.

(2) Hyperplastic goitre (exophthalmic).

(3) Adenoma, toxic: the status of which is a pure hyperthyroidism: an intrinsic affection of the thyroid gland, in which extirpation invariably results in a cure, providing secondary changes have not taken place in the heart muscle.

(4) Adenoma, simple: which includes the adenomata which are not associated with hyperthyroidism and the various types of cystic and calcareous degeneration. It is estimated that in this group from twenty to twenty-five per cent. develop symptoms of hyperthyroidism at some time in their history. It is in this group, too, that haemorrhages most often occur; and, finally, it is in this group that the majority of malignant adenomata have their origin.

(5) Adenoma, malignant.

This classification does not take into account the rarer forms, namely, (a) adenoma associated with areas of hyperplasia, and (b) the diffuse adenomatosis of Goetsch.

To illustrate the advantages of the adoption of such a classification, we would call attention to the frequent application of the term "toxic goitre" to toxic adenoma, whereas the premier type of toxic goitre is undoubtedly the hyperplastic. Again, one meets with the term "hyperplastic adenoma", which is doubly confounding, because in the first place "hyperplastic" is the term accepted pathologically as the equivalent of the term "exophthalmic", and in the second place the histological feature of hyperplasia is absent in adenoma of the toxic type. So much for classification.

Our knowledge of the regional incidence of adolescent goitre is being placed upon a surer basis by the work of Kimball[1] and others. We may also give rational advice upon the prevention of adolescent goitre. But we are not yet in a position to state definitely the percentage of goitres which recede under the administration of the iodides or the percentage which, if left untreated, would ultimately go on to cystic or adenomatous changes. The number of adolescent goitres that eventually become hyperplastic must be very small, if, indeed, such a change ever takes place.

The differentiation of hyperplastic goitre from toxic adenoma should always be possible from the history and physical signs: a differentiation which bears directly upon prognosis and treatment. The ultimate prognosis in both types really depends chiefly upon the duration and intensity of the toxaemia. While the generalization, that hyperplastic cases are chiefly characterized by nervous phenomena and toxic adenomata by cardio-vascular changes, is frequently applicable, it may not be at all applicable in given cases. Again, while the greatest myocardial destruction is undoubtedly met with in toxic adenoma, we feel that clinical experience does not warrant the assertion, that patients suffering from this condition seek advice primarily because of failing compensation. Electrocardiographic observations show that a majority of these cases do not present evidence of myocardial change. The frequency with which myocardial changes are met with in toxic adenoma may be attributed in part to the rather advanced age of incidence, namely, forty-seven years.

With regard to treatment, the consensus of opinion undoubtedly is that early and thorough surgical intervention yields the best results in both types of toxic cases, and, while the use of radium or x-rays certainly adds to the difficulty of a later operation, we are not justified in saying that they have no effect upon the one class of case to which such treatment is applicable, namely, hyperplastic goitre. It must be borne in mind that a severe or even fatal reaction may be evoked by the ligation of a single pole under local anaesthesia even more readily than by x-rays or radium. As Means[2] has shown, the effect of x-rays may be so substantial that not only are cases of hyperplastic goitre restored to health, but over-irradiation may lead to the development of myxoedema. A further well-established fact is that, while preliminary ligation will, by temporarily reducing the basal metabolic rate, render hitherto inoperable cases safe subjects for radical procedure, the effects of ligation are not lasting or curative. The present trend in practice, if repeated observations show a steady decline in the basal rate with coincident improvement in general nutrition, is to postpone operative interference until such time as complete thyroidectomy or right lobectomy with ligation of the left upper pole can be safely undertaken. In the last analysis, each case of hyperplastic goitre should be made a separate study, and surgical judgment should be concentrated upon the questions of time of operation and extent of procedure.

E. M. Eberts

References

(1) Kimball, *American Journal of the Medical Sciences*, CLXIII, p. 634. (2) Means, *Journal of the American Medical Association*, Vol. 77, pp. 347-352.

ON GAS INFLATION IN X-RAY DIAGNOSIS

At the last meeting of the British Medical Association, an interesting discussion took place on the value of gas inflation in x-ray diagnosis. The opening paper was read by Dr. Herniman-Johnson who said that the idea of obtaining contrasts in skiagraphs by the injection of air is almost as old as radiography itself, for shortly after its introduction deliberate attempts were made to throw light upon abdominal problems by the artificial inflation of the stomach, colon, and bladder. The normal stomach as described in x-ray text books of the present day, was figured by Williams in 1899, and to him rather than to later German workers should go the credit of originating the opaque meal idea. The idea, however, of inflating the peritoneum for diagnostic purposes appears to have originated in Germany within the past ten years. It can scarcely be denied that it represents a definite advance in diagnostic technique with which the introduction of the opaque meal method is alone comparable in importance. Unfortunately, while the opaque meal and enema are almost entirely free from risk, peritoneal inflation is not free, and in a recent review of the subject Case has collected records of four deaths. Of these one was due to the introduction of oxygen into the spleen; one to a subsequent peritonitis; and in the other two the patients became suddenly cyanotic and collapsed a few seconds after the introduction of the needle before any appreciable amount of gas had entered the peritoneum. Choyce states that in a few individuals the diaphragm is not an absolute unperforate membrane and may permit some communication between the abdominal and thoracic cavities. Under such circumstances a condition of pneumo-thorax may gradually take place with serious embarrassment of the heart's action. Should any untoward symptoms develop, this possibility should be remembered, and could promptly be demonstrated fluoroscopically. Such an explanation of the two sudden deaths reported, however, appears improbable as cyanosis was said to have occurred almost immediately. It is possible that in a few individuals some slight trauma to a sensitive peritoneum is sufficient to produce reflex impulses inhibiting cardiac action. Apart from this rare condition safety in inflation of the peritoneum may be secured by careful technique. The use of a fine needle is most desirable. A suitable place for the puncture is through the belly of one of the recti muscles, about two inches below the level of the umbilicus. With caution one soon learns to feel when the needle passes through the posterior sheath. Perforation of a large vein should be avoided and if blood oozes out of the open end of the needle it should be withdrawn and should be re-inserted lest one inject gas into a vein. The gas should be introduced slowly from a suitable apparatus. Should the end of the needle have failed to completely penetrate the parietes, and be still in the muscle, pain will be produced at once; if the needle is through the abdominal wall, it must be in the peritoneal cavity, or in some solid organ, which is enlarged and mal-placed; or in the substance of an abnormal growth; or in the lumen of the bowel. In the latter event, some of the gas will be passed per anum.

The amount to be introduced varies according to the special conditions, but as a rule about three litres is sufficient in an adult of average size. If the inflation gives rise to any pain or distress, the inflation should be checked and no attempt should be made to reach any special limit. To prevent the introduction of any infection into the peritoneum, absolute asepsis must be employed; and the possibility of doing damage by the mechanical effects of intra-peritoneal distension must always be borne in mind. Protective adhesions may be broken down and virulent septic organisms be let loose. The immediate after care of the patient is also of great importance. It is essential that the patient remain in the horizontal position for several hours, preferably for a complete day. This means that the examination should be carried out upon a stretcher fitting the top of the x-ray table, so as to permit the patient being carried back to bed with the least possible disturbance of position.

Significance of Chronic Jaundice.—S. Laache has made a study of chronic non-haemolytic jaundice in sixteen men and fifteen women between the ages of nineteen and seventy-six. Most of them were middle-aged or elderly; nineteen came to necropsy and three others to biopsy (operation). In as many as fourteen of these twenty-two cases cancer were diagnosed. The importance of gall stones as a cause of chronic jaundice proved to be comparatively slight, and they were found only in seven cases, in three of which they were associated with malignant disease. As in these three cases the gall stones may have developed as the result of the cancer the importance of cancer as compared with gall stones in the genesis of chronic jaundice is seen to be very great. Cirrhosis of the liver was found in two cases, the disease probably being syphilitic in one of these cases. A remarkable feature of the other case of cirrhosis was the definite improvement that followed the exploratory laparotomy at which the diagnosis was made; this improvement was, however, not maintained. This materal shows how essential it is to arrive at an exact diagnosis before treatment is attempted.—Brit. Med. Jour., December 16th, 1922.

Men and Books

LABORATORIES: THEN AND NOW

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JUST one hundred years ago, on October 12th, 1822, according to Dr. Abbott's history of this school an advertisement appeared announcing a course of lectures in Natural Philosophy and Chemistry to be given at the Montreal General Hospital. These combined subjects representing the experimental sciences of the day have been surprisingly fertile and by a succession of cleavages have left a profusion of descendants. For full fifty years, however, their offspring lived at home, whereas now in later generations, no longer content to do so, they each and separately demand their own separate domicile. The first evidence of this modern tendency here at McGill was seen in 1874, when the students' cloak-room was fitted up to give a summer course in practical histology. Like the mustard-seed Maisonneuve planted long ago on your romantic soil, so this other seed has grown.

It is a simple story of industry, unselfishness and academic loyalty, a story which touches the present gathering in many and surprising ways. After his graduation Osler had gone abroad with the avowed intention of studying ophthalmology under Bowman; Bowman was a man primarily of the laboratory and so sent him to Burdon Sanderson, who in University College was then (1872) giving one of the first practical courses to students in a comparatively new subject, or, more accurately speaking, an old subject newly interpreted, namely physiology. There is neither time nor space to tell how in England, anatomy came to give house-room to this inconsiderate waif, which soon eloped from the home of its foster-parent in company with histology, the daughter of the house. What is more, the two ran away with the microscope, which at University College is only just now after half a century being reclaimed by its rightful owner, the Professor of Anatomy.

But at this time, Physiology and Histology were living contentedly together in Burdon Sanderson's laboratory, and there Osler made his early microscopical studies of the blood and received the general training which in some degree fitted him for the position proffered by this Faculty soon after his return. The young Professor of the Institutes of Medicine at McGill in the fall of 1874, inherited no laboratory; he was expected merely to share a lecture-platform, and was informed that his predecessor had a collection of diagrams which he probably would dispose of very reasonably. The Institutes of Medicine, as a chair, has disappeared, but fifty years ago, as some few of this audience will remember, it comprised nearly all that three of your chosen speakers of to-day now separately represent: Zoology, Botany and Physiology, and, what is more, Histology and Pathology as well. "A settee, not a chair." Principal Dawson, though primarily a geologist, incidentally taught Botany and Zoology, and, as may not be known, endeavoured to prevail upon Osler to take over these two subjects, the Dean adding that a three-months' course in pathology with the use of the microscope might well enough be added to the botanical course. Indeed, was not Linnaeus himself a physician?

It is a good example of how vague, ill-determined, and transitory are the boundary-lines between the curricular subdivisions of the medical sciences. The introduction of a new instrument like the kymograph, or a new procedure which requires special training and technique may make it necessary to draw the lines anew and create a specialty. Thus the aniline dyes and pathogenic bacteria revolutionized pathology, just as the X-ray is now revolutionizing clinical diagnosis. On the other hand, if the novelty is needed for the advancement of several subjects at once it may serve to obliterate time-honoured boundaries and cause fusion of specialties. So it was with the compound water-immersion microscope to which Osler the school-boy had been introduced as field-student of zoology and botany, and since he possessed at this time the only one in the school, and since pathological anatomy as well as normal histology were as much in need of this unfamiliar instrument as botany and zoology, it was a natural suggestion that all these subjects should gravitate toward the Institutes of Medicine—toward the man with the microscope, both of them cumbersome instruments from our present-day standpoint, as the man often insisted.

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*Abstract of an address delivered October 5th, 1922, at the opening of the New Biological Buildings, McGill University, Montreal. The full address will be published shortly by the University.

Osler's first paper, indeed, was on a zoological subject, "The Canadian Diatomaciae," sent while a Toronto undergraduate to the Montreal Natural History Society; and another, "The Canadian Fresh-Water Polyzoa" followed a few years later. Meanwhile, as his student notebooks show, he was feverishly engaged in a study of entozoa and of animal parasites in general—indeed the literature of the nematodes contains a *Filaria Osleri*, and of helminthology a *Sphyranura Osleri.* It was an interest that subsequently led him into comparative pathology, into his early public-health activities here in Montreal, and in later years with his pupils into eager studies of trichinosis, the amoeba of dysentery, and the malarial plasmodium. In these various ways he came in contact with botany and zoology, but it was not until he entered Burden Sanderson's laboratory that he touched the edge of that rising tide of modern physiology on whose very crest Professor Sherrington now rides.

Abraham Flexner tells of visiting a medical school during the progress of his investigations, and on expressing a desire to see the physiological laboratory, mentioned in the school's prospectus, he was told that if he would wait a moment it would be produced, and shortly afterward the janitor appeared with a sphygmograph in his hand. So in the first years of Osler's advent, the laboratory of the Institutes of Medicine in this school was a portable affair and consisted principally of the professor's microscope.

A clinical device has been perfected whereby at the same moment many students may listen through a single Medusa-like stethescope, and we may also nowadays project the microscopic field on to a screen, but in the seventies a single microscope meant one eye at a time and, though a good beginning, this did not go far with many eyes eager to see. That more microscopes, in some way, had to be provided was providential in Osler's case, for had there been no necessity to raise money with which to procure an additional supply he might never have been drawn into the clinic, where he really belonged. An opportunity came to earn a few hundred dollars as voluntary attendant on the smallpox cases congregated in one of the wards of the Montreal General Hospital. Though a hazardous job it was eagerly accepted, and in the end he used the small salary to import from Paris a dozen Hartnack microscopes for his class.*

To supplement these microscopes he purchased ere long a single kymograph, together with a few other pieces of laboratory apparatus which, as he confessed in later years, he never could perform. This may have been because the professor was his own servant, for it is my experience that the most important and reliable piece of apparatus in any laboratory is a trained Diener of the old order, without whom many experiments and lecture demonstrations are doomed to failure. The race, alas, is vanishing, and before their complete disappearance it would be illuminating if some one of them, like Bartels of the Hallerianum, would put on paper something from the standpoint of the Diener about "laboratories and laboratory-workers I have known."

But for an Osler neither a servant nor elaborate equipment was essential. The candle of understanding can be lighted in more ways than one. For even though the apparatus may be perverse and the demonstration fail, principles, ideas, and inspiration may be conveyed through other mediums, and so with the aid of a laboratory manual which he wrote, the students were taught to see and record for themselves some of the simpler biological phenomena which their new microscopes could reveal. Those who recall the times, prejudiced witnesses though they be, insist that no better course has ever been given, and if the interest and enthusiasm a teacher arouses in his students is a gauge of a successful exercise, those given in the Institutes of Medicine in the seventies must have far exceeded the mere requirements of the Dean's office and the curriculum.

So for five years this course continued in makeshift quarters, partly in the chemical laboratory, partly in the students' cloak-room during the summer sessions, and when in 1880 one of the lecture-rooms in the then "new" medical building was finally converted into a physiological laboratory to keep pace with the growth of this particular course, the last word in laboratories has been said. It is true that similar things were going on in other medical schools, but here at McGill, at least, this was the beginning of the modern science-laboratory movement, whereby the anatomical dissecting-room, for generations the only place where observation was called for and the special senses were trained (until the bedside at least was reached) has come to be largely supplanted.

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*These were the first practical student microscopes, water-immersion affairs, improved by E. Hartnack in 1855. The apochromatic objectives of Abbé were not introduced till 1886.

The ambition to have better surroundings is human, and the belief that through them better men will be secured, and that in them better and more productive work will be done, is a natural enough assumption though it has not always proved to be justified. It is the individual rather than his surroundings, the individual with that rare combination of qualities, the ability to convey knowledge and the gift of visualizing problems, coupled with that tenacity of purpose which pursues them to the end. Brains have more to do with this than bricks; imagination and ideals more than complicated apparatus installed in magnificent halls. All Roland the physicist asked of Mr. Gilman in the early days of the Johns Hopkins was a dwelling-house and a kitchen sink. Koch's fundamental discovery was made while a practitioner of medicine in a home-made laboratory, not in the Königliche Institut für Infektionskrankheiten. Pasteur in the garret of the old Ecôle Normale could be more productive than a host in later years at work in the institute named for him. Lister conducted his classical experiments in a cubicle off from his private consulting-room. Just a century ago Beaumont began his revolutionizing studies on digestion, sharing his successive domiciles with that incorrigible and fistulous Alexis St. Martin, a necessary participant of his researches. Claude Bernard worked in a cellar at the College de France. John Hunter carted his specimens up the back stairs of that rambling establishment in Leicester Square while Mrs. Hunter was giving soirées in the front drawing-room. Jenner was a country doctor. Harvey had no laboratory. Vesalius detached from the gallows the body of a criminal and smuggled it to his home to dissect. And to come back to our modern times, Osler made his reputation as a pathologist at the Montreal General, and later in the old Blockley Hospital of Philadelphia, working in quarters a modern pathologist would scorn. And it is of course with the hope of giving the greater opportunity to a genius of the first order, or even to lesser geniuses, and indeed to give all a share—"a leaven of science"—through personal experience however slight, with what these others, the Hunters and the Harveys, the Beaumonts and the Bernards of our profession have really accomplished, that superb laboratories like these new ones of yours are regarded by the calculating business head of modern philanthropy as an investment, certain in the long run to bring dividends.

There is abundant reason for the practical wholesale teaching of the pre-medical sciences, so that all medical students may be trained in the laboratory method, for even though they may themselves never become laboratory workers they must at least learn by personal experience to evaluate the returns which now come from clinical laboratories, many of them private concerns run by technicians who have assumed the name of laboratorians, and whose reports to an unsophisticated profession, unfamiliar with the methods whereby they are obtained, are looked upon as more dependable for purposes of a diagnosis than any information to be gained by observation at the bedside.

Someone has said, "The knowledge which a man can use is the only real knowledge, the only knowledge which has life and growth in it and which converts itself into practical power. The rest hangs like dust about the brain and dries like raindrops off the stones." And with the growth of this modern laboratory movement we must beware lest the student be kept too much away from the bedside, which now some of them scarcely reach until after their graduation, when, too late for tutelage, they find themselves as practitioners suddenly plunged in the deep waters of professional responsibility, with scant clinical experience and only the straw of the clinical-laboratory tests to grasp at.

THE LATE PROFESSOR JOHN JOSEPH MACKENZIE, B.A., M.B.

Resolution passed at the meeting of the Senate of the University of Toronto held on November 10th, 1922

On motion of Professor Irving H. Cameron
Seconded by Professor J. J. R. Macleod:

By the Senate of the University of Toronto

BE IT RESOLVED that in the lamentable death of Professor John Joseph Mackenzie, Professor of Pathology and Bacteriology, this Senate, in common with the whole University, has sustained a grievous loss.

The Committee appointed for the purpose, at the last meeting of the Senate, begs to submit the following citation of facts and its sentiments of appreciation thereupon.

On Emancipation Day (1st August) 1922 there went his Westward way and entered into rest a man greatly beloved, who shall also stand in his lot at the end of the days.

J. J. Mackenzie was born in the town of St. Thomas, C.W., on the 24th of March 1865, the elder son of Donald Kennedy Mackenzie and Mary MacAdam. His paternal grandfather was the Reverend John Mackenzie, an eminent divine of the Scottish Church, whose blood blended with other streams has had other representatives in Canada, notably in Knox College, Toronto, in the persons of the late Professor Halliday Douglas, and Professor H. A. A. Kennedy, now of New College, Edinburgh. There is a similar connexion also with the distinguished Rainy family of Glasgow and Edinburgh.

Having received his preliminary education in the Collegiate Institute of his native town, J. J. Mackenzie entered University College, Toronto, in 1882. Family associations brought him under the influence of Professor A. B. Macallum and thence under the spell of Professor R. Ramsay Wright, and so the Biological Course was his inevitable goal, and by this route he graduated with First Class Honours in 1886. The wider instruction in General Biology into which he thus entered gave him a larger view and a better perspective than fall to the lot of many pathologists and made him the broad-minded and clear-sighted man he was. With a view of laying still broader his foundation as a devotee of the Biological Sciences he went to Europe immediately after graduation and entered the Medical Department of the University of Leipzig, where he studied anatomy under Professors His and Braune; and physiology under Professor Ludwig, of whom he was a favourite pupil, and Dr. von Frey. He subsequently went to Berlin and studied physiological methods and research with Dr. Gad in Dubois Reymond's laboratory, and Bacteriology in Professor Koch's Institute under Drs. Globig and Fraenkel. Moreover he did not fail to take advantage of the opportunity of association with the great Virchow, the founder of the Cellular Pathology. Having been appointed to a Fellowship in Biology in this University he returned to Toronto and continued in that post until 1890, when he was appointed Bacteriologist to the Provincial Board of Health. He served this post ten years, and in 1900 became Professor of Pathology and Bacteriology in his Alma Mater. This duty and his life-long devotion to Her, often at considerable personal loss and sacrifice, ceased only with his death. During Professor Ramsay Wright's absence in Europe in 1890-91, he was detailed to discharge part of his duty, and, in addition to lectures delivered in the Faculty of Arts, he dealt with Animal and Vegetable Parasites in the Faculty of Medicine. In 1893 he was appointed Professor of Bacteriology, Normal Histology and Comparative Anatomy in the Royal College of Dental Surgeons; and in 1896 Instructor, and in 1897 Lecturer, in Bacteriology in the Medical Faculty. In 1899 he took his medical degree in the University; and in the following session (1899-1900), owing to the illness of Professor John Caven he was called upon to complete the course of lectures in General Pathology to students of the Third Year. This probation was so satisfactory that when the post fell vacant in the following autumn he was appointed to the Chair. Perhaps it may be permissible to quote here a couple of unconnected sentences from the "Memorial Resolution"passed last month by the Academy of Medicine to convey an idea of the estimate in which Professor Mackenzie was held by the general medical profession: "As a member of the Academy Professor Mackenzie came into touch with the profession at large and brought his wide training and knowledge to (bear upon) matters of importance in the practice of medicine." "Not only has the Academy lost one of its most distinguished members, and the University one of its outstanding Scientists and teachers; but in the passing of Professor Mackenzie many of us have lost an inspiring friend, and scientific medicine a noble exponent...... In looking over papers that he has read before this Society, his sympathy with the clinical application of scientific advance is continually in evidence. Through the Academy, too, he had an influence on the trend of medical affairs outside the circle of his immediate University duties, and the value of his wise opinion in matters of general medical progress is perhaps best realized when it is no longer available." Since Professor Ramsay Wright, our first and only Vice-President, is no longer here to say a word on this occasion, as he would desire to do, it may be suitable to recall some words of his written in a prophetic strain in 1900. "Mackenzie possesses a very extensive knowledge of the literature of Modern Pathology, facilitated by his mastery of French and German, a weapon equally useful to the teacher and to the investigator, and he further possesses unfailing tact in his dealings with those with whom his duties bring him in contact, a quality likely to endear him both to his pupils and to his Colleagues." How completely this prophecy was fulfilled, nay amplified, throughout the generation which has succeeded its utterance, the comments and encomiums elicited by his death, from Colleagues, pupils and a host of friends and admirers amply testify.

His one great grief in his professorial life was that despite his qualifications and preparation for research and his indefatigable industry, his ambitions and abilities in that sphere were cribbed, cabined and confined by the more immediately pressing demands of his docent and tutorial duties and the dry as dust details of departmental administration. Despite this, however, he did make some contributions to the advancement of knowledge; and the record of them is to be found scattered through the various Journals of Pathology and the Transactions of the Royal Society of Canada and of the Royal Canadian Institute, and in the proceedings of the Royal Society (of London) concerning researches upon the Physiology and Pathology of the Kidney made in conjunction with his colleague, our late Professor of Physiology, T. G. Brodie, F.R.S. He made many contributions to the Academy of Medicine (Toronto), to the different Canadian Medical Journals, the American Public Health Association and periodicals and to the London Lancet. And your Committee begs leave to append hereto a list, compiled with considerable care and industry by those who are carrying on his work at the instigation of one of us, Professor J. J. R. Macleod, of his professional writings so far as accessible at the moment, comprising some sixty-eight titles. It may be of interest to remark here that "the 'Negri bodies' of rabies were seen and described by him before the published observations of Negri himself," but his much occupation at the Board of Health at the time prevented his working out their full significance. He was largely instrumental in the elaboration and introduction of the six year Medical course and in the recent Faculty Reorganization. Apart from local Associations, he was a Member of the British Association for the Advancement of Science, the American Association of Pathologists and Bacteriologists, the Society of Experimental Pathologists, the Society of Experimental Biology and Medicine and the American Public Health Association; also a Fellow of the Royal Society of Canada, from 1909 on, and he served for eight years as Secretary of "Section *IV*" therein. He served for many years as Pathologist to the Toronto General Hospital.

In 1915 he went "Overseas" with No. 4, Base Hospital, (the University of Toronto unit) and worked with it as Pathologist at Salonica and in England; and he wrote a paper on the Basingstoke Hospital, hitherto unpublished, in which he was latterly stationed. On the Civil Hospital side he contributed a paper upon "Hospital Organisation" before the Mt. Sinai Hospital, N.Y. so late as 27th February, 1919. His opportunities at Salonica for the special study of Dysentery were improved to the extent of evolving a therapy for that very fatal disease, the scourge of armies, from which No. 4 Base Hospital gained great kudos. While in Salonica he developed an affection of the heart supposed to have been of infective origin, and, although he made a temporary recovery, it is quite possible that this was the beginning of his ultimately fatal malady, Streptococcic Endocarditis, of which one form of dysentery is a congener.

Professor Mackenzie was married in 1892 to Miss Agnes Kathleen Vesey-Rogers of Dublin, who survives him. As a man, chivalry and gentleness and sweetness of disposition were outstanding characteristics. He was courteous and considerate to all; but "to those men who sought him sweet as summer." He was loyal to his Alma Mater, loyal to the traditions of his ancient family, loyal to his friends, in other words, a thorough Highlander who embodied the sentiments and the virtues of his receding race. And now he has wended his way to the "Land o' the Leal." Of great amiability and friendliness his bounties of good will came back to him in unstinted measure in his latter days of failing health; and the constant enquiries and frequent visits of innumerable friends must have assured him of their undying interest, affection and esteem. Few men in this community have had such a host of friends so genuine, so devoted, so sincere.

He took his recreation on the links, being an enthusiastic golfer; and in literature and in music. In literature he had a fine and a discriminating sense, and in music, like Lucentio, he knew "the cause why music was ordained. Was it not to refresh the mind of man after his studies and his usual pain?" His keen appreciation of literature on many lines stood him in good stead, and greatly helped to allay the tedium of his long illness which rounded out the circle of the year.

Lastly, he was a President of the students' Alpha Omega Alpha Society, of the Royal Canadian Institute, and from 1920 a member of this Senate.

The first practical expression and acknowledgment of our indebtedness to him, and desire to perpetuate the memory of his life and service, is contained in the recent announcement that Graham Colin Campbell, Esq., B.A., M.B., whilom of the University Staff, has donated a sum of five thousand dollars for the purpose of founding a Scholarship, bearing the name of Mackenzie, in the Faculty of Medicine.

His spirit fareth forth from our companionship, *permultis bonis flebilis*, but his mortal part lies buried at Gravenhurst in Muskoka, "as the tree fell."

Dum Exspectamus, quoad diluculum Domini Diei.
Requiescat in pace.

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Other papers not known to have been published.

Basingstoke Hospital." "Hospital Organization." (Delivered at Mount Sinai Hospital, N.Y., February 27th, 1919). "The Studyof a Case and the Pathology of Acromegaly." "Generalized Blastomycosis." "A Case of Acute Haemorrhagic Pancreatitis due to Impaction of a Gall-Stone in the Opening of the Diverticulum of Vater," (American Pathologists and Bacteriologists, 1909). "On Cast formation in Experimental Nephritis." 'On a Case of Congenital Stenosis of the Aorta at the Isthmus." "Pus Formation," Paper read at Royal College of Dental Surgeons). "Notes on the Newer Pathology of Syphilis." "Malignant Tumours as a Form of Tissue Mutation." "Adrenal Exhaustion." Address given at Opening Chapter A.O.A. McGill University, February 24th, 1912.

Intra-abdominal Haemorrhage from Stomach Due to Osteopathic Treatment: Report of Case.—One of the possible dangers of indiscriminate mechanotherapy is illustrated by the case reported by B. J. O'Neill and W. W. Crawford, San Diego, Calif. A woman, aged twenty-two, eleven hours before admission to the hospital had been seized with severe abdominal pain and slight vomiting shortly after eating radishes, which had always disagreed with her. A person calling himself an osteologist, and claiming to be an improvement over the osteopath, was called in, and subjected her to vigorous abdominal massage, followed by manipulation of the neck. To accomplish this, he threw her face downward over his knee, striking her abdomen against his knee. This caused an immediate increase in the abdominal pain. This continued, became colicky in character, and vomiting increased. The patient was taken to the hospital for treatment. A diagnosis of probable ruptured appendix was made and immediate laparotomy undertaken. When the abdomen was opened, slightly to the right of the median line, there was a gush of bright red blood and about three pints (1.5 liters) of fluid and clotted blood was removed with the fingers, swabs and pump, the clots being of varying consistency, none more than a few hours old. Careful exploration of the abdomen and pelvis revealed no abnormalities except a bleeding point on the greater curvature of the stomach, from a ruptured branch of the gastro-epiploic vein about half an inch from the border of the stomach, at the point at which the stomach crossed the spinal column. This was tied with fine catgut. Recovery was uneventful. —*Jour. Am. Med. Assoc.*, November 4th, 1922.

Abstracts from Current Literature

MEDICINE

The Circulation of the Cerebrospinal Fluid, its Importance in Acute Cranial Injury.

Jackson, Harry. *Jour. Amer. Med. Assoc.* Vol. 79, No. 17, p. 1394.

An abstracted review of a paper by the same author was published on page 433, of the June, 1922, issue of the Canadian Medical Association Journal, and this article is a further contribution to the same subject.

The author bases his observations on four hundred cases at Cook County Hospital in the past three years. The cerebrospinal circulation from the choroid plexus to the cerebral sinuses is described and the effect of trauma on this noted. The cerebral oedema which develops in head cases in twenty-four to forty-eight hours after injury subsides in from three to seven days in cases that recover. This oedema is due to haemorrhage, meningeal and arachnoid, and damage to the meninges and cortex with resulting increased intracranial pressure. This presses the brain upwards and against the skull with pressure on the sinuses and slowing of the rate of absorption of the cerebrospinal fluid. Brain anaemia will follow brain congestion unless the pressure is relieved, and a vicious circle is established, with resulting medullary pressure, slow pulse, rising blood pressure, rising temperature, increasing coma and death. The use of the spinal manometer gives an accurate record of the intracranial pressure, and the exact graduated withdrawal of cerebrospinal fluid by lumber puncture will control this pressure. Cerebral anaemia may, in twelve hours, produce changes in the cerebral cells, inducing gliosis and resulting in post-traumatic neuroses.

The administration of sodium chloride in daily doses of 150 grains (10 gm.) in capsules, coated with salol, will reduce intracranial pressure it is claimed, and may be used in alcoholic oedema, as well as post-traumatic oedema. The above line of treatment replaces subtemporal operative decompression in the majority of cases, and shows a reduction of mortality of from twenty-five to fifty per cent. It is to be noted from experiments that anaesthetics rapidly increase brain oedema in these cases, and chloroform and ether are recoverable from the cerebrospinal fluid in increased percentages in traumatic cases. Even an increase of five per cent. in the degree of brain oedema may prove fatal.

Chas. K. P. Henry

Nitrogen Retention in Chronic Interstitial Nephritis and its Significance.

Berglund, Hilding. *J.A.M.A.*, October 21st, 1922. Vol. 79, No. 17.

In the kidney not only does simple filtration occur, but definite chemical processes are carried on. There is the synthesis of hippuric acid from glycocol and benzoic acid, the regulation of the reaction of the urine from the bicarbonate carbon dioxide system of the blood, to the phosphate mixture of the urine, and the elimination of the end products of protein metabolism.

The phenomenon of disturbed nitrogen elimination is the most important from the standpoint of diagnosis and prognosis. The normal non-protein nitrogen of the blood consists mainly of a mixture of two classes, viz: those concerned in the anabolic, and those in the catabolic processes. In conditions of more or less marked non-protein nitrogen retention the different waste products such as urea, creatinine and uric acid are increased in approximately similar proportions. With an increase of non-protein nitrogen, one might expect an increase of the amino nitrogen or at all events a delayed deamination; this is not the case. On the other hand, in acute yellow atrophy of the liver, where the most extensive body tissue autolysis takes place, the amino nitrogen is increased while the urea nitrogen may be normal. A third variation is that found in gout in which the uric acid is increased while the urea nitrogen may again be normal.

An increase of the non-protein nitrogen in the blood above that which may be obtained in normal individuals subsisting on a high protein diet, means, in all cases an impairment of the kidney, which is bilateral. It does not, however, indicate the type of lesion. A patient with a chronic contracted kidney has suffered a loss of renal tissue anatomically as if removed experimentally, while in surgical conditions such as obstruction, or again in the acute infectious diseases there is a functional disturbance which readily improves with removal of the cause. The blood findings then must be interpreted according to the disease present.

A. H. MacCordick

Lethargic Encephalitis. (Editorial). *B.M.J.*, October 7th, 1922.

Few epidemic diseases in modern times can have aroused more general interest or provoked so much discussion and research as lethargic or epidemic encephalitis. A sifting of the accumulated pile of clinical and pathological material, and taking stock of the results of work extending over nearly four years, is presented to us in the recent report of the British Ministry of Health. We may be glad to find how much solid achievement can be recorded. In the first place, it is now generally conceded that the disease is a definite clinical and pathological entity. The pathology rests on a sure foundation of established fact, and although the actual histological changes found in the central nervous system may closely resemble those in other conditions, and notably in acute poliomyelitis, yet there are differences sufficiently distinctive to enable the experienced pathologist to make a definite diagnosis in any given case. The large amount of experimental work performed in this country, in America, and on the Continent, has been successful in establishing that the cause of the disease is a filtrable virus closely analogous to that of acute poliomyelitis. One of the most recent and hopeful achievements of experimental work has been the artificial production of an immunity to the disease in rabbits by vaccination with the living virus. Clinical observations have been equally fruitful in results. Indeed, the number of "types" or varieties of the disease reported has proved confusing. But despite the almost bewildering number of shapes under which the disease may appear there are yet some characteristic clinical pictures. Of these the first and most important is that which Netter originally described as the "triad" of symptoms, consisting of somnolence, fever, and ocular palsies. Next in importance we would place the form in which the clinical picture of paralysis agitans is produced—the so-called Parkinsonian type. In this form the disease constitutes a very striking and characteristic clinical picture which is even now not sufficiently recognized. Nor is it realized how commonly this Parkinsonian state is progressive and terminates in death within a space to be measured by twelve or fifteen months. Another type, sufficiently striking to deserve a name to itself, is the myoclonic form; it may vary from occasional involuntary muscular contractions, enough just to disturb the patient or arouse the interest of the medical practitioner, to a condition where the patient lies in a classical "typhoid state," to which violent and irregular muscular contractions, especially of the abdominal musculature, lend a profound and, to the experienced eye, a disquieting significance. To the mental changes induced by the disease too little attention has been paid. Even when the patient seems to have made a good recovery it will usually be found that some degree of mental disability remains. On this point especially we are in urgent need of further information. This uncertainty, and the not infrequent cases in which relapses or recrudescences seem to take place, combine to make prognosis a matter of exceptional difficulty. He will probably be wise who takes pains to emphasize the gravity of the disease save in the most mild cases. Diagnosis also abounds in pitfalls. Except in certain cases—like that of the Parkinsonian type, where the picture is characteristic—it is generally safer to proceed to a diagnosis by way of exclusion than by any other method. The conditions most likely to be confused with it are, according to the report of the Ministry of Health, tuberculous meningitis, cerebral tumour, and cerebral haemorrhage. To this list it would be wise to add syphilis of the nervous system. Obviously, therefore, the aid of the pathologist should be sought in the examination of the cerebro-spinal fluid. For although he may not be able to find any absolutely typical changes, especially in late cases, yet a negative report will often be of great value by excluding tuberculous or syphilitic conditions.

We have already touched on the need for care in giving a prognosis. This caution is especially necessary when it is remembered that as yet we have no specific remedy, though we may hope that the experimental workers will perhaps be able to provide us with a truly specific method of treatment. In certain cases of the Parkinsonian type it seems that the administration of hyoscine in full doses has been productive of good, albeit of temporary, results. The treatment by means of fixation abscess, so much advocated in France, has not been much followed here. Nor has the treatment by urotropine or hexamine been much more satisfactory. In fact, we have yet to find a drug which can exert an effect on such inflammations of the central nervous system as encephalitis lethargica or acute poliomyelitis.

Some Observations on the Bacteriology and Vaccine Treatment of Chronic Bronchitis; Based on 300 Cases, With Special Reference to Associated Nasal Infections. Mackey, Leonard. *B.M.J.*, October, 192, p. 715.

In the author's opinion the treatment of chronic bronchitis with autogenous vaccines has sometimes failed because: (1) Between the time of collecting it and plating out a portion of the sputum for culture it has not been kept warm and some of the offending organisms have died out. (2) A swab from the nasal passages has not been taken at the same time and thus a type of organism, partially at any rate responsible for the bronchitis, but not necessarily present in the sputum, has been missed. A pneumococcus may be found in the nose but not in the sputum and vice versa in the case of the influenza bacillus. Interesting tables are given showing the number of times various micro-organisms are found in the nasal passages and sputum.

The patient may not even complain of a nasal catarrh yet an organism can be grown from the back of the nose, which, when added to the vaccine made from a culture of the sputum, is very "useful" in the treatment. The striking successes cited by Mackey occurred mainly with the pneumococcus, influenza bacillus, Friedlander's bacillus, and streptococcus mucosus. Mackey is not convinced that the diphtheroid bacilli are important. The mixed vaccines are sterilized by heat and fifteen doses of increasing strength are given at weekly intervals, taking care that the strength is not too quickly raised as to give rise to an unpleasant reaction. "Such a course appears to confer an immunity lasting a year or more in the case of those who continue to be carriers, and for an indefinite period in the case of those who cease to be infected."

Archibald Malloch

Pernicious Anaemia. Panton, P. N. *The Lancet*, November 18th, 1922.

Dr. P. N. Panton reported before the Medical Society of London, the cases of pernicious anaemia treated in the London Hospital from 1909 to 1920. There were 117 cases. The disease was the result of a slow, continuous haemolysis, and the diagnosis was made on the clinical state together with the blood picture. Other diseases gave the same clinical picture, and the blood picture might occur in such conditions as poisoning by arsenuretted hydrogen gas. (As H_3). Achylia, glossitis, fever and intestinal disturbances were fairly constantly present, but associated conditions were rare, except subacute combined degeneration of the cord. Oral sepsis was not a marked feature in the series, and although all the patients received thorough dental treatment, the writer does not think any case was cured in this way. Achylia was almost invariably present in the cases examined (33 of 35 cases). Pernicious anaemia may occur without achylia, and achylia frequently occurs without pernicious anaemia. Secondary anaemia might be followed by achylia and this might persist even if the anaemia were cured. Achylia might result from haemolytic anaemia, or if present before, favour the entry of toxin producing agents into the system. Pyrexia was noted in 90 of the 117 cases. Improvement was synchronous with a return of the temperature to normal; the more acute the disease, the more constant the fever. The fever suggested an infective origin, but might also be accounted for by the haemolysis.

In the treatment, oral sepsis should be attended to, but wholesale extraction of teeth was to be deplored and the writer considered vaccine treatment of no value. An artificial gastric juice should be given for the achylia. It has been claimed that splenectomy prolonged life, but the published results give the duration of life as about the same as in this series, where splenectomy was only done once. Blood transfusion was of value only in prolonging life. Arsenic had a well established reputation. Both organic and inorganic preparations were used and sometimes a change from one form to the other gave good results. Cases appeared to find a certain level where the blood count was about a million and where the destructive and regenerative process appeared to balance. At these times arsenic often did not seem to have any effect.

Bothriocephalus anaemia and an acute anaemia which sometimes developed late in pregnancy or during the puerperium could give the same blood picture, but in the former the characteristic glossites was absent and in the latter the rapid onset or rapid recovery served to differentiate it from true pernicious anaemia.

Arsenuretted hydrogen poisoning which occurred on submarines during the war gave the blood picture, but in addition deep jaundice and haemoglobinuria. These cases if they lived a few days usually recovered. Grave anaemia may also occur as a result of paroxysmal haemoglobinuria from various causes and in blackwater fever, and after injection of haemolytic serum or an incompatible blood transfusion. There are also three obscure types of haemolytic anaemias.

1. (1) Occurring in children ending fatally in a few months.
2. (2) A form like the arsenuretted hydrogen poisoning cases with attacks of jaundice and haemoglobinuria. These run a chronic course.
3. (3) A rare form in which with the blood picture of pernicious anaemia there is intense pigmentation of the skin.

In the discussion that followed, Dr. Hurst said he thought achlorhydria was a predisposing factor. He had twelve cases in which the achlorhydria had preceded the anaemia by 1-12 years. The achlorhydria may be due to constitutional achylia gastrica (said to occur in 4% of normal young men)—or to alcoholic gastritis or where gastrectomy has been done for carcinoma. Pernicious anaemia occurs in 10% of these achlorhydria cases and Hurst says that this is due to oral sepsis and possibly some associated vulner ability of the blood or bone marrow. Streptococci were found in the duodenum of each of his twelve cases of pernicious anaemia with combined degeneration of the cord. Achlorhydria favoured infection of the intestine and by delay in digestion of protein favoured the absorption of toxins. Dr. Maitland Smith said in the series the average number of remissions was two, and the average duration of the remission was six months. Eight of the series were still alive and of these, three were living at seventeen, fourteen, and eight years after the onset of the disease. The seventeen year man was an apparent cure; he had no symptoms and his red blood count was 5,200,000. When in hospital thirteen years ago it was 1,500,000 and he had complete achylia.

Dr. Connybeare, who had collected the cases admitted to Guy's Hospital from 1909 to 1922, thought the disease was becoming more frequent, and that the gastro-intestinal symptoms were often due to arsenic. In his series gastrointestinal symptoms developed in 35% before arsenic was administered. All cases examined showed achlorhydria with one exception and that case recovered.

Dr. Riddock discussed the associated spinal cord lesions. In 84 per cent. they occurred in the postero-lateral columns. Similar lesions occurred in ergot poisoning and in pellagra, in both of which diseases the toxins were probably blood borne.

R. H. M. Hardisty

The Opaque Meal; Its Present Day Value in Gastric Lesions. Scott, S. Gilbert. *Lancet*, November 18th, 1922.

The writer reports the results of the examinations by means of the opaque meal, for the last year at the London Hospital. The system used to check up and compare the x-ray and operation findings, is a perforated slip attached to the x-ray report sheet, and on this the surgical findings are noted at the time of operation. In this way a very close check can be kept.

In the method of examination employed by him, after the administration of the barium cream in small quantity careful palpation is made over the region of the stomach and the cream is thus smeared over its internal surface, which can then be examined from cardia to pylorus and small lesions recognised. Any lesion demonstrable by the ordinary radiograph can be seen by this method, and often an ulcer may be visualized that does not show in a radiograph. The diagnosis is made on direct evidence, and the clinical history does not matter. The writer thinks too much reliance is placed on the emptying time as this is influenced by many outside factors, e.g., apprehension, fear, hunger, etc. In a normal stomach a variation of four hours has been obtained by dieting.

Two hundred and forty seven cases of those examined were operated upon, and the x-ray diagnosis was found to be correct in 231. There were eighty-eight negative reports given all of which were proved correct by operation.

The cases where a wrong diagnosis had been made included five cases called negative which showed healed ulcer in one and ulcers high up in the cardiac portion in four. Four more which were called gastric ulcer, were found to be duodenal ulcer.

R. H. M. Hardisty

SURGERY

Haemorrhagic Osteomyelitis. Barrie, Geo. *Jour. of Bone and Joint Surg.*, October, 1922. Vol. 4, p. 653.

This is a bone lesion which has heretofore often been mistaken for sarcoma, when in reality it is of a benign character. It presents a pathological picture of highly vascular granulation tissue, appearing as replacement material in an area of spongy bone. In it are found so-called scavenger cells with many nuclei which have usually been taken for giant cells of malignant sarcomata.

Haemorrhagic osteomyelitis is commonest in the long bones of the lower limbs, the lesions as a rule being generally found in the spongy bone more frequently near the joint. In a skiagraph the area, if small, is clearly cut and rounded or oval. When larger it may be less clearly defined. It may cause expansion of the bone but does not break through periosteum or epiphyseal cartilage. If the periosteum has been broken through, malignant sarcoma should be suspected. The presence of haemorrhagic osteomyelitis may cause pathological fracture, which, however, will unite readily. The lesion is to be regarded as non-suppurative and inflammatory, in most instances of traumatic origin. It is not degenerative or destructive, but rather nature's effort to form primary replacement tissue in a previously destroyed bone area. The bony substance may be fully restored, while partial restoration may leave a fibro-cystic condition. A small lesion is apt to be taken for a bone cyst, a larger one, the size of an orange, for a sarcoma. The important point in treatment is to currett it and not to amputate the limb. J. A. Nutter

Pain Due to Ilio-Costal Impingement. Gaenslen, F. J. *Jour. of Bone and Joint Surg.*, October, 1922. Vol. 4, p. 705.

The costal margin may at times rub against the crest of the ilium, thus causing pain. This has been described in cases of severe scoliosis. It may however occur in a variety of conditions where the diagnosis is not so obvious. The pain and tenderness occur exactly where the costal margin touches the iliac crest. The ribs involved are the tenth but especially the eleventh. The pain can be produced at will by allowing the patient to assume a relaxed sitting position, by which the costal margin is crowded against the crest of the ilium. Pain referred along the tenth, eleventh and twelfth ribs, caused by Pott's disease, renal calculus, or appendicitis, may appear in this area and may be excluded by its wider distribution and lack of localized tenderness. A therapeutic test is to pull the trunk away from the affected side by adhesive strapping. The patient may be given a seat higher on the affected side. Where the condition is pronounced resect a couple of the ribs in question. X-ray examination gives unsatisfactory evidence. J. A. Nutter

Osteoarthritis of the Hip. Parker, Geo. *B.M.J.*, September 23rd, 1922, p. 539, No. 3221

A table of joint diseases prefaces this article, in which Group A is characterized by diseases showing little or no affection of the fibrous or synovial structures but great bone and cartilaginous changes, as exemplified by osteoarthritis and gout. In the B group septic causes are acknowledged. In B1, we find suppuration, as septic and tuberculous joints. In B2, there is no suppuration but fibrous overgrowth and ankylosis as exemplified by rheumatoid arthritis and gonococcal joints. B3, the last group in the writer's classification, leaves no permanent joint changes, as in true rheumatism.

The writer insists on the tendency of osteoarthritis of the hip to be essentially monarticular and of a distinctive character, though he admits that some authors disagree with him, considering that it may follow or precede similar changes in other joints. The symptoms are given in great detail, pain, tenderness, pseudo-locking, attitude, muscular wasting, grating, and x-ray changes. Sometimes the hip presents the exact picture of an impacted fracture of the neck of the femur. It is noted that lameness and limited movement may exist long before bone changes are shown in the x-rays. Pathological changes are thinning of the cartilage at the centre of the joint, thickening at the periphery, with new bone formation and eburnation.

As regards etiology, J. Llewellyn is quoted as pointing out the influence of trauma to the hip. This may be acute, or may be chronic due to knock-knee, flat-foot or a short leg. Mr. Strangeways, of the Cambridge Research Hospital, considers that thickening of the vessel walls may bring about changes in the nutritive value of the synovial fluid, which under normal circumstances, is a source of nourishment to the articular cartilage. Altered nutritive value in this fluid leads to cartilaginous degeneration and fibrillation. There is no evidence of a neural origin of the disease, and very little in favour of an endocrine influence, though osteoarthritic changes occur in acromegaly. P. W. Nathan with others is quoted in favour of an infective origin, streptococci being lodged in the neighbourhood of joints whose circulation is least active.

In treatment he recommends the remedying of any obesity, flat-foot, etc., capable of causing joint strain; limiting the exercise taken. Very early cases have a good chance of complete cure by absolute rest, the hip should be immobilized and no weight-bearing permitted. Such cases must be differentiated from gout and sciatica.

There is not the same tendency to ankylosis as exists in rheumatoid arthritis, and which makes immobilization so dangerous in this latter condition. More advanced cases need leather spicas, radiant heat and massage. Pain is relieved by ionization with salicylates and iodides, hot sand bags, and the inunction of salicylic acid and menthol. Arsenic and thymus gland are advocated internally. Removal of the head of the femur has given good results, the neck articulating in the acetabulum, while ankylosing the joint gives relief from pain at the expense of movement.

J. A. Nutter

Treatment of Chronic Synovitis of the Knee-Joint. Atkins, G. G. *B.M.J.*, June 17th, 1922., No. 3207, p. 948.

The importance of this condition in army practice is pointed out. The knee-joint is full of fluid, while the vastus internus muscle is invariably wasted and cannot be fully contracted. In old-standing cases some lateral instability of the joint is usually present, tenderness on pressure may be elicited over various points around the head of the tibia. In the majority of cases the semilunar cartilage is not at fault, and a diagnosis of injury to it should not be made unless there is a very definite history of locking of the joint at the time of the original injury. A strain of the internal lateral ligament is a common cause of chronic synovitis, and very often simulates a torn cartilage. The principal nerve of supply to the knee-joint also supplies the vastus internus, hence injury to the knee reflexly inhibits the action of this important muscle. So long as the vastus internus suffers lack of tone the effusion will recur on the slightest strain, hence one breaks the vicious circle by re-establishing tone in this muscle. This is done by increasing the blood supply to the area affected, (1) contrast baths, (2) limited active exercise of all the muscles about the joint, and (3) massage. The patient is not confined to bed but allowed light exercise over even ground. Occasionally a tight bandage over wool is applied to the knee at night. Tender points found at the insertion of tendons about the joint are due to local strain. Care must be taken in the diagnosis to eliminate intra-articular conditions, tuberculosis of the knee-joint, and also an effusion of the joint due to a hypertrophic inrrapatellar pad of fat, in which case suitable limitation of complete extension must be provided for.

J. A. Nutter

ANAESTHETICS

The Anaesthetization of Patients for the Classical Caesarian Section. Spencer, Herbert R. *B.M.J.*, November 11th, 1922, p. 905.

The writer is convinced of the harmlessness of chloroform given "a la reine" to mitigate the pains of labour, but insists on the necessity of anaesthetization by a specially trained qualified medical practitioner whenever an operation is required. Inhalation methods, he considers, are preferable in Caesarian section to spinal or infiltration anaesthesia, being more humane. In some pulmonary and cardiac affections, one of the latter methods may have to be used. Chloroform is more dangerous than ether when administered to the surgical degree, especially in pregnant women. The disadvantage of ether is that it leads to asphyxia of the infant, which is not true of chloroform administered to the minimal surgical degree.

The writer's method is as follows: No preliminary hypodermic is given. Chloroform is administered and as soon as the anaesthetist says the patient is ready, the operation is rapidly performed, and the child, usually delivered within thirty to forty seconds from the commencement of the operation, always breathes and cries at once. Ether is then administered for the rest of the operation, usually by the open method.

W. B. Howell

The Accidents of Spinal Anaesthesia. How to Recognize, to Control and to Treat Them. (Les Accidents de la Rachianesthesie. Comment les apprecier, les limiter et les traiter.) Hertz, J. *Paris Medical*, March 11th, 1922, p. 214.

Accidents in connection with spinal anaesthesia may be divided into immediate and secondary. *Immediate*: These are due to poisoning of the medulla. The symptoms may be slight, e.g., sensations of cold, pallor, sweating, nausea and vomiting; or severe, e.g., mydriasis, slow small pulse, loss of eye reflexes, cessation of respiration. Some of the deaths during spinal anaesthesia have resulted from other causes than the anaesthetic. Death occurring more than two hours after the injection cannot be attributed to the substance injected, as by that time it has all been eliminated. Secondary: Lumbar puncture alone sometimes causes symptoms which last several days, such as headache, pain in the back, nausea and vomiting. Septic infection may occur. Cerebrospinal meningitis has been precipitated in a carrier of the germ.

There are two sets of symptoms, equally transient, associated with variations in the cerebrospinal pressure. With hypertension there may be headache, pain in the back and nausea, which are relieved by drawing off some of the cerebrospinal fluid, or somewhat similar symptoms with stiffness of the neck, mydriasis, and weak pulse due to hypotension. Doses of artificial serum given hypodermically have relieved the latter type of case. Paralysis of sphincters is very rare. Persistent headache and various paralyses occur sometimes in patients with syphilis. Headache, paralysis of the oculomotor nerve and of the sphincters have been commoner with stovaine than with novocaine. These paralyses appear from the eighth to the fifteenth day after anaesthesia and disappear usually in two or three weeks.

For the prevention of sequelae attention must be paid to certain points. Some of the cerebrospinal fluid should be withdrawn, a very fine needle should be used, the dose should be accurately gauged, and stovaine should be abandoned. The quantity of cerebrospinal fluid withdrawn should be regulated according to the height of anaesthesia desired and the existing pressure in the subdural space. It is easy to determine the latter with a Claude's manometer.

In doubtful cases, the immediate examination of the cerebrospinal fluid for Wassernan's reaction may be done and, if positive, the spinal method abandoned.

Spinal anesthesia is suitable to all ages.

Treatment of Accidents: A prophylactic hypodermic injection of caffeine should be given and the dose repeated on the appearance of any of the lesser symptoms. On the appearance of any of the graver symptoms, such as failure of respiration and pulse .25 gramme of caffeine should be injected intraspinally with some force. Artificial respiration should be kept up until there has been time for the elimination of the anaesthetic.

W. B. Howell

Present Status of Blood Nitrogen in Surgical Lesions of the Kidney.—W. H. Olmsted and J. R. Caulk, St. Louis, point out that there is considerable difference in the interpretation of the retention of blood nitrogen in the different classes of kidney disease. In chronic nephritis, such as is seen in the medical wards of any hospital, there has been a gradual destruction of kidney tissue, analogous, from the functional standpoint, to the experimental surgical removal of kidney tissue; while, in the infectious and obstructive processes of the genito-urinary tract seen by urologists, the loss of kidney function may be, in a large measure, of a functional nature. After drainage and removal of the obstructions, the functional loss may be partially regained. If the latter conditions have gone on long enough, permanent loss of kidney function results, just as in the case of chronic nephritis. Among the authors' cases, the cases of chronic nephritis were not materially improved, as shown by the failure of the nonprotein nitrogen to go down after having reached this level, and by the high death rate. Cardiac patients show a decided difference from nephritis. With them, recovery from retention of nitrogen depends disease due to obstructive and infectious processes. Their experience has been that if the blood nitrogen does not reach a normal level within a month of hospital treatment, it will never do so. The interpretation of the reten- entirely on how well the heart will respond to treatment. Still better are the results of kidney tion of urea depends on the nature of the disease present, and especially on the presence of systemic intoxication. With retention of urea, bilateral disease is always present, whether anatomic or functional or both.—*Jour. Am. Med. Assoc.*, October 21st, 1922.

Lumbar Puncture in Intracranial Haemorrhage of the Newborn.—De Stephano (*La Pediatria*, January 1st, 1922) says that lumbar puncture is definitely indicated in intracranial haemorrhage of the newborn. It should be practised as soon as possible, and repeated if necessary several times. There is no danger if it is done with careful technique. The effect is both immediate and remote, and tends to lessen nervous symptoms of encephalic origin. In addition injections of adrenaline, calcium chloride, or normal serum may be given.

News Items

GENERAL NEWS

Dr. Haigh, a member of the Epidemic Commission, of the League of Nations, who visited the provinces of Nikolaieff, Kherson, and Odessa, in September, describes the serious situation of the medical and health institutions in a report addressed to Dr. Nansen. The hospitals lack everything for their good working. Drugs, linen, soap and disinfectants are all wanting, even clinical thermometers are very scarce.

Financial "light ahead" in Periodic Examinations.—Fiske gives the annual cost of sickness per head of the population as $30, which is $150 per average family or about $270,000,000 to $300,000,000 annually in Canada. This item yields some most interesting consequences. Contrary to general belief, "doctor's bills" form a very small item in cost of sickness, the total of physician's share of the total bill averages, on pre-war figures, only $1.00 per head, $5.00 per family, or $9,000,000 for all Canada. If we treble this amount for advanced rates since the war, still the physician receives only 10% of the total cost of sickness, or $27,000,000 annually out of a total cost of $270,000,000. Periodic examinations of everybody at $5.00 per head (which is but 1/6 of the cost per head of being sick) would yield the medical profession $45,000,000 *from this source alone.* as compared with a *total* now, of $9,000,000 or even of the exaggerated figure of $27,000,000. Moreover, the improved financial status of the public due to earlier treatment, lessened sickness, etc., would make collections better. Finally, note that this *new* $45,000,000 would be *in addition* to whatever income physicians would still receive for therapeutic services, which would probably be about as much as at present; not because sickness would not be reduced but because much sickness not now treated would come to light. From 30 to 60% of sickness requiring medical services is now never treated. In other words, the *reduction in sickness now treated* by the medical profession would be, in part at least, offset by the *increase in treatment of sickness now escaping attention.* Periodic examinations would thus be of immense ultimate economic value, (a) to the public, in reducing the total cost of sickness to say, $100,000,000 in Canada instead of $300,000,000 as at present and, (b) to the medical profession, in yielding to the latter from 40 to 50% ($40,000,000 to $50,000,000) of the future reduced cost, rather than a mere 10% or less ($27,000,000 to $9,000,000) of the present much greater cost. H. W. HILL

Of interest to every member of the profession in Canada, as well as to the University of Pennsylvania, from whose gazette we copy this notice, was the unveiling last summer, of the war memorial to the men of Cambridgeshire, in England. The sculptor was Dr. F. Tait McKenzie, director of the department of physical education at the University of Pennsylvania, a Canadian and a graduate in medicine of McGill University, whose name is honoured throughout the world for his beautiful statuary as well as for his pioneer work in the restoration of crippled soldiers during the war. The memorial was unveiled by the Duke of York, and represents the homecoming of a young soldier. The modelling, which occupied three years, took place in Dr. McKenzie's studio in the tower of the gymnasium, at the University of Pennsylvania. A young American, captain of the swimming team in the University, posed for the figure, the head of which was modelled from a young English student at Christ Church College, Cambridge. The figure, it is claimed, combines the best type of young manhood in England and America as seen through Dr. McKenzie's experienced eyes and is another link between the University of Pennsylvania, its older sister in England, and Canada. The statue is erected at the junction of three roads in the centre of Cambridge, and its unveiling was witnessed by an immense crowd. As soon as the ceremony was over, wreaths and bouquets of flowers were heaped in great masses about its pedestal.

NOVA SCOTIA

In summarizing the work of the public health nurses of the Massachusetts-Halifax Health Commission from the Health Centres of Halifax and Dartmouth, the November report sets forth that a total of thirty-four hundred and eighty-eight visits were made in a total of twenty-three hundred and seventy-three homes. In addition, the visiting house-keepers made three hundred and twenty-one visits making a total of thirty-eight hundred and nine instructional visits.

At the end of November, twenty-two hundred and twenty-seven families were receiving public health nursing guidance from the Health Centres: of these, twelve hundred and forty-eight are under the supervision of the Health Centre clinics where their various members may also receive medical, dental and nutritional guidance from the physicians and dentists connected with these clinics. The number of babies under two years of age receiving public health nursing guidance totals one thousand and ninety-four. One hundred and thirty-nine prenatal visits were made by public health nurses during November, twenty-six to clinic cases, and one hundred and thirteen to other expectant mothers.

The tuberculosis examiner conducted a total of twenty-three clinics and made a total of forty-three complete chest examinations in this service, in addition to services given at the city tuberculosis hospital and Dalhousie medical school.

The Saturday morning health classes for children have attracted considerable attention during November. Health lessons in song have proved a most popular feature. Miss MacLeod, of Halifax Ladies College, kindly volunteered to act as accompanist at these morning sessions. An increased interest has been manifested ever since the Healthland Railway, so successfully used at the G.S.V.A. Exhibit at the Armouries, has been set up at the Health Centre. Many of the railway stations along the line, suggestive in appearance as well as name, have been brought into the most recent health song, set to the rousing tune of Marching Through Georgia, Bathtubville, East Toothbrush Cereal, Hot Soup Springs, Vitamine Centre, etc. This feature of the Health Centre activities has raised the attendance of children to thirty or more every Saturday morning, and makes a total Saturday attendance of children of more than fifty.

NEW BRUNSWICK

Next year the New Brunswick Medical Society will establish a new precedent by having its annual meeting outside the boundaries of the province. In conjunction with the Maine Medical Association, the New Brunswick organization will hold a combined meeting at Houlton, Me., on June 12th and 13th next. Much good is expected to result from this getting-together and it is hoped that the meeting will not only prove of exceptional interest from a scientific standpoint but will also tend to increase the good will and friendliness that has so long existed between those who practice on different sides of the international border. An exceptionally fine programme is in course of preparation and already there is no doubt that the meeting is going to prove at least as instructive and entertaining as has any previous annual meeting.

It is given to but few of us to experience the outpouring of good will that was apparent when it became known that Dr. Stewart Skinner, for years the registrar of the N.B. Council had found it necessary to seek treatment at Muskoka. His official position had brought him in contact with all the physicians of the province and by all of them his fine character was appreciated. Of an even and placid temperament his counsel was sought by many—especially the younger men—and his services were freely offered wherever they might be of use. A good student, a hard worker and an enthusiast in his chosen profession, he upheld the highest traditions of our art and his kindliness of manner and his deep Christian charity endeared him to all those with whom he came in contact. Though past the age when military service could be expected from him, he answered the call of his country in the great war and undoubtedly the unusual hardship and necessary exposure were the causes of his present condition. His friends in the profession sincerely hope that his case will be one of the many in which proper environment and treatment establishes a complete cure. To those of us who know his many good deeds and charitable actions, nothing less seems possible for one whose whole life has been a shining example of what a doctor's life should be—unobtrusive, self-sacrificing and charitable to the fullest possible extent.

At the last meeting of the N.B. Society, the executive was instructed to make the necessary arrangements preparatory to increasing the fee charged for insurance examinations. It was hoped to get the profession to unanimously agree on a fee which we had reason to believe would be acceptable to the Canadian companies. Each practitioner was asked to pledge himself not to charge less than the agreed upon fee. After much correspondence and work the executive has decided to pass the responsibility back to the society as it seems impossible to get even a reply from a large proportion of the members of the society. The replies received make very interesting reading as practically all seem to fear that if they insist on getting the new fee, someone in *their* immediate neighbourhood will be willing to do the work cheaper and for this reason will have a monopoly of the business. Experience has shown these fears to be well founded. As one doctor puts it, "We have a lot to learn from the labour organizations." He suggests that a chair of Business be established in all our medical colleges. There is much merit in the suggestion. Another practitioner seems to express the feelings of a majority of our members in a letter from which the following extracts will probably prove of interest in any part of Canada where an increase of the insurance fee is under discussion:

> "I am in favour..................
> "How many doctors will live up to the schedule?
> "There is not that bond of unity or spirit of tolerance or co-operation which should exist between members of the medical profession . ."
> "I am not refusing......I am waiting......"

The opening of the new Health Centre in the finest residence in Saint John marks an epoch in the history of preventive medicine in the Maritime provinces. For Dr. Roberts, the Minister of Health, it is the culmination of his efforts to lay in New Brunswick the foundations of the most modern health legislation to be found on this continent. Of its value to the city and surrounding country little need be said in a journal intended for medical men. The citizens responded generously in equipping and supporting the venture and the staff is well organized and prepared to demonstrate the usefulness of this innovation in the life of the city.

The Health Centre has been officially opened and has had an auspicious start on its career. The province, the city, the citizens, and the medical profession all united to enable it to begin its work under most favourable conditions. From now on its future depends on itself and in this connection it might be suggested that the powers-that-be should make a great effort to work in harmony with the physicians and avoid even the slightest suspicion of friction or jealousy. The paths of both lie in the same direction. With the co-operation of the medical men the Health Centre can prove of inestimable value to the city; without it, it will prove to be merely another fad which is sure to be short-lived. With the Minister of Health and the various heads of departments there will be no difficulty but it might not prove amiss if they would emphasize to their subordinates the necessity of confining themselves within the limits of their work and so avoid trespassing on the field of the practitioner. There are some people who lose their sense of proportion (if they ever had one) and imagine that their particular hobby is of the greatest importance, to the exclusion of more important things; and in such an undertaking as a Health Centre, those in charge must realize that even of more importance than the organization is the faith that patients have in their family physician. It would be most regrettable if the Health Centre of St. John failed to have the hearty support of all the doctors in the city. Such a thing might easily be caused by injudicious remarks made by any of the staff in reference to the professional ability of the city's general practitioners. *Verbum sat sapienti.*

QUEBEC

Orders-in-Council providing for the appointment of Dr. Eustache Langis, Matane, as joint coroner for the district of Rimouski, and of Dr. T. O. Martin, Montreal, as Inspector of Hygiene, were signed to-day by the Lieutenant-Governor.

Cancer Research. The offer of Lord Atholstan of a prize of one hundred thousand dollars for the discovery of a cure for cancer has brought 2,715 claims for the award from forty-one countries. On advice of the Royal Colleges of Physicians and of Surgeons of London, claimants, to entitle them to a consideration of their alleged cures in competition for the prize, must satisfy a recognized medical faculty or medical society in his or her own country, first, that there is some scientific basis to justify experimental investigation of the professed cure, and that any cases said to be successfully treated were in fact cases of cancer.

Claimants who have satisfied the above conditions should request the medical faculty or medical society to report to the Imperial Cancer Research Fund. The Imperial Cancer Research Fund will then determine the means to be adopted to investigate the claims of the applicant if the Committee are of the opinion that a case for investigation has been made out. The competitors are advised that the recommendations of the Royal Colleges of Physicians and Surgeons therein are adopted as the basis of enquiry.

Unveil Painting of Dr. Penhallow. Many friends and associates of the late Dr. David Pearce Penhallow, F.R.S.C Macdonald Professor of Botany at McGill University from 1883 to 1910, witnessed the unveiling in the botanical laboratory of the Biological building of a portrait presented by his widow. Dr. C. E. Moyse, emeritus vice-principal and emeritus dean of the Faculty of Arts, performed the ceremony, following a tribute by Professor Carrie M. Derick, professor of morphological botany, who was associated with Dr. Penhallow in his work at McGill. Among those present at the ceremony were the executive of the National Council of Women, now in session here, their hostesses, officers of the Montreal Local Council, and representatives of affiliated societies, who were guests of the university for the afternoon. It was appropriate, Professor Derick pointed out, that the portrait of Dr. Penhallow should be unveiled in the presence of the National Council of Women. He advocated equal opportunities for men and women at a time when such a doctrine was not as popular as it is to-day. The first woman on the McGill teaching staff was appointed at his suggestion, with the understanding that she should have equal opportunities with men. Later, he advocated her promotion. Dr. Penhallow also showed great interest in the work of the National Council of Women. Professor Derick then sketched Dr. Penhallow's distinguished academic career. Dr. Moyse's tribute was the tribute of an old friend. The whole university had a great respect for Dr. Penhallow as a man and a scholar. "This university will be happy if it can get and keep men like Dr. Penhallow" he concluded. Guests were received by Sir Arthur and Lady Currie, professors and their wives. Tea was served in the laboratory.

Hospital Campaign Started. A million dollar anti-tuberculous hospital, with an endowment representing a cash expenditure of nearly two millions, in return for a subscription of $150,000, is the substance of the offer made by the City of Montreal and the Provincial Government of Quebec to the people of Montreal, by the gift of Mont Lasalle site and building in Maisonneuve and cash grants which they have subsequently offered, subject to the citizens raising the sum above mentioned by public subscription. The city gave over 600,000 square feet of land in Maisonneuve Park and a large building some time ago for this purpose, subject to its being equipped as an anti-tuberculosis hospital. They later agreed to subsidise 200 free beds in the hospital, to the extent of $73,00 per year for twenty-five years, on condition that the beds should be available to any citizen of Montreal suffering from tuberculosis regardless of creed, colour or nationality. It was found necessary to spend $300,000 in order to turn this property into the largest hospital of its kind in Canada, and equip it with the best installation possible to combat the disease. Of this sum, the Provincial Government has given $150,000, subject to the citizens of Montreal raising by public subscription the remaining $150,000. A subscription campaign opened December 11th continuing for a week, during which time it was confidently anticipated that the required sum would easily be attained. The effort is under the patronage of Lord Shaughnessy, Mgr. Gauthier, Hon. L. A. Taschereau, Mayor Martin. No canvassing was to take place. The committee in charge of the campaign declare that the need is so obvious, and the issue so simple that personal solicitation in their opinion should not be necessary. The issue has been clearly stated, namely, the raising of $150,000 by public subscription in order to secure for Montreal a $3,000,000 hospital, and to lay the foundation of a work for the stamping out of tuberculosis which the Provincial Government has pledged itself to carry throughout the province. The attitude of the committee now is that the people of Montreal and district are free to take it or leave it and the decision lies in their hands.

Fighting Tuberculosis. The proposal to equip the civic building in Maisonneuve Park as an anti-tuberculosis hospital draws attention once more to the need for government action. The enterprise and devotion of private individuals in equipping and maintaining various hospitals and other institutions designed to combat the worst scourge of the century is wholly admirable, and not a word can be said against it. But individual scattered efforts are, after all, infinitesimal when regarded as preventive factors. If they could all be co-ordinated under one central direction and management; if the government were to take up what is undoubtedly a duty it owes to the nation, and tackle this problem of fighting tuberculosis on an adequate scale, there might be some hope of reducing the death toll taken annually by this grim reaper of death.

ONTARIO

District No. 2 of the Ontario Medical Association, comprising the Counties of Carlton, Dundas, Glengarry, Prescott, Renfrew, Russell and Stormont, held its annual meeting at Ottawa on Thursday, November 2nd. The morning session was held at the Ottawa General Hospital, when Dr. Eugene St. Jacques, Surgeon to the Hotel Dieu, Montreal, gave a lucid and interesting talk on Thyroid Pathology; Hypo-and Hyper-thyroidism; their clinical aspects and therapy, illustrating the same by clinical cases and lantern demonstrations. During the noon hour, buffet luncheons were served at the various hospitals. Between 12:30 [and 2:30 p.m. operative clinics were simultaneously conducted at St. Luke's Hospital and the Ottawa General Hospital, many members of the staff taking part. The pathological department of St. Luke's Hospital also showed some very interesting specimens, and, between the hours of two and three o'clock, gave demonstrations of the method of making chemical examinations of blood and urine. At 3:00 p.m. an interesting and instructive medical clinic was conducted by Dr. W. T. Connell, Professor of Medicine, Queen's University. At 6:00 p.m. the members sat down to an informal dinner at the Chateau Laurier, which was immediately followed by addresses from Dr. E. R. Secord, of Brantford, and Dr. T. C. Routley ,of Toronto, President and Secretary, respectively, of the Ontario Medical Association. The attendance during the day was 148, and in the opinion of all those present the meeting was successful from every point of view.

The North Simcoe branch of the Ontario Medical Association, met in Alliston on December 14th. Dr. N. B. Gwyn, of Toronto, addressed the meeting on "Pneumonia and empyema, their diagnosis and treatment."

The Ontario Medical Association has sent out a post-graduate schedule of extension lectures and demonstrations. These lectures and demonstrations are largely the results of the work of the committee on education. An extensive programme is offered dealing with hygiene and preventive medicine, physiology and biochemistry, pathology, pharmacology and therapeutics, medicine, paediatrics, surgery, obstetrics, gynaecology, radiology, oto-laryngology, and some general miscellaneous subjects. The committee on education consists of Drs. J. H. Mullin, Hamilton, chairman; T. C. Routley, Toronto, secretary; L. J. Austin, Kingston, J. W. Crane, London, V. E. Henderson, J. J. Middleton, George S. Young, Toronto, A. F. McKenzie, Alliston, and the president of the Ontario Medical Association, Dr. E. R. Secord, Brantford. The interest in these demonstrations has been growing and they have now become a very material part of the Ontario Medical Association's work.

At a special meeting of the Academy, Dr. Andrew Fullerton, C.B., C.M.G., delivered an address on "Aches and pains of renal origin."

The Sault St. Marie medical society met on November 3rd. Dr. N. B. Gwyn, of Toronto, spoke on the diagnosis and treatment of pneumonia and its complications.

At a stated meeting of the Academy of Medicine, Toronto, the inaugural address of the president, Dr. Harris, was followed by a paper on "Recent advances in x-ray therapeutics," by Reginald Morton, of London, England.

Dr. F. A. Cleland, of Toronto, addressed a meeting of the Peterborough County Medical Society, on the evening of December 7th, on the subject, "Diagnosis and treatment of acute abdominal pelvic conditions."

The Norfolk County Medical Society held a meeting in Simcoe, on the evening of December 6th, at which an address was given by Dr. Geo. A. Ramsay, of London, on "Fractures."

On the evening of December 8th, Dr. P. G. Goldsmith, of Toronto, addressed the North Waterloo Medical Society, at Kitchener, taking as his subject, "The management of some common complaints among oto-laryngological patients."

The Medical Alumni Association, of the University of Toronto, met to unite and reorganize on November 7th. The Association is to include all medical graduates of the University of Toronto schools, and the old Trinity, Victoria, and Toronto Medical schools. It is hoped that the active interest in all matters relating to medical education will be stimulated by the Alumni Association. Dr. H. B. Anderson, Toronto is president, and Dr. Harley Smith, Toronto, is secretary-treasurer.

The corner stone of the new Isolation Hospital, in Kingston, was laid on October 31st. This new department of the General Hospital which has cost in the neighbourhood of $200,000, will be one of the most modern on the continent. Those who took part in the ceremonies were, R. E. Kent, chairman of the General Hospital board of governors, R. Bruce Taylor, principal of Queen's University, W. F. Nickle, M.P.P., and Dr. J. C. Connell, dean of Queen's Medical Faculty.

On the evening of December 1st, Dr. R. D. Rudolf, of Toronto, addressed a meeting of the Perth County Medical Society, in Stratford, on the subject, "The treatment of insomnia;" and on December 8th, Dr. W. L. Robinson, of Toronto, addressed the same society on, "Classification, pathology, diagnosis, and treatment of new growths." There was a good attendance at both meetings and the discussion which followed the addresses showed that the members were keenly interested.

A special meeting of the Ontario Medical Association was held in the Academy of Medicine, Toronto, on Wednesday, December 6th, for the express purpose of discussing medical legislation. The meeting was called to order by the president of the Association, Dr. E. R. Secord, of Brantford, who, asked the 1st vice president Dr. J. F. Argue, of Ottawa, to take the chair. Dr. John Ferguson, chairman of the Committee on Legislation and By-Laws, in presenting the subject for discussion, outlined four possible lines of action for the Association to consider, these being as follows: (1) A policy of "watchful waiting," making no attempt to secure advanced legislation, but merely opposing any enroaching measures that may be suggested by the irregulars. (2) A policy of progressive action. This again may be subdivided into, (A) Pressure brought to bear on the government to introduce a Medical Bill. (B) The introduction, as a Private Bill, of new medical legislation by the joint representatives of the profession. (C) The introduction, as a private measure, of an amendment to the present Medical Act, giving a new and comprehensive definition of the practice of medicine. After very lengthy deliberations and discussions which were participated in by most of the large gathering present, it was unanimously decided that the Association adopt a policy of progressive action. Assurances having been received that the College of Physicians and Surgeons of Ontario were willing to put forth special efforts during the coming session of the Provincial House calculated to secure adequate medical legislation, it was further decided that the Ontario Medical Association should whole-heartedly support the College in such efforts. Furthermore, the Ontario Medical Association decided to respectfully request the College to direct particular attention towards securing the necessary incorporation in the Medical Act of a proper and comprehensive definition of the practice of medicine. It is worthy of note that the College of Physicians and Surgeons, the Ontario Medical Association, and the three Universities of the province have respectively appointed representatives to a committee known as the Joint Advisory Committee, to which body is being entrusted the duty of outlining and co-ordinating the complete line of action which it is expected shall be officially sponsored by the entire medical profession of the province. The practitioners of medicine in Ontario, having now definitely decided to actively press for proper medical legislation, it behooves every medical practitioner in the province to get behind the idea and render every possible assistance.

The annual dinner of the St. Thomas Medical Society was held in the Grand Central Hotel, St. Thomas, on the evening of Friday, December 8th. The guests of the evening were, Dr. E. A. Morgan, of Toronto, who spoke on "The pneumonias of childhood;" and Dr. T. C. Routley, of Toronto, secretary of the Ontario Medical Association, who talked on the activities of the provincial Association. There was an attendance of twenty-four, which evidenced the interest being taken in the local medical society by the practitioners of the district. Both papers were keenly discussed, and from every point of view, the meeting was quite a success.

Dr. Perry Goldsmith, of Toronto, addressed the Niagara District Medical Association in Niagara Falls on the evening of Thursday, December 7th, on the subject, "The management of some common complaints among oto-laryngological patients." There was a splendid representation present, and the very practical manner in which the subject was presented was appreciated by the members attending.

Dr. H. I. Kinsey, of Toronto, addressed the Midland Division of the Simcoe County Medical Society at Port McNicoll on the evening of Decmber 4th, his subject being "The differential diagnosis of diseases of the chest."

BRITISH COLUMBIA

The British Columbia Medical Association through its Executive and Committees is having an exceptionally busy time. The Legislative Committee under the chairmanship of Dr. P. A. McLennan has done excellent work at Victoria in connection with the "Chiropractic" Bill, the result of which is not yet to hand. It is, however, confidently expected that the proposed "Bill" brought forward by the chiropractors to enable them to practice without the existing qualifying examination will be unsuccessful.

A proposed "Public Health Campaign" on an extensive scale is under consideration by the Educational and Publicity Committee. Apart from a systematic "Press" campaign it is hoped to put on a series of public addresses throughout the Province in February next.

The Industrial Service Committee is engaged on various important matters especially in regard to Industrial Medical Contract Practice in connection with which there are many much needed reforms.

Vancouver Medical Association

Dr. E. Murray Blair has recently started practice in Vancouver.

Dr. R. J. Elvin has recently left Vancouver to take up special work in California.

The clinical meeting of the Association was held in the Vancouver General Hospital on the 21st of November, and several interesting cases were shown.

Dr. J. A. Sutherland is at present in the Old Country taking a post-graduate course, and Drs. W. B. Burnett, B. H. Champion and H. B. Gourlay have been East for the same purpose.

The annual dinner of the Vancouver Medical Association was held in Vancouver on Thursday, November 9th. One hundred and fifty members of the Association were present, and spent a very enjoyable evening.

The October monthly meeting of the Association was held in the University of British Columbia, on the 7th of November, the subject for discussion being Gastric and Duodenal Ulcer, in which Drs. W. S. Baird, H. H. McIntosh, J. M. Pearson, A. B. Schinbein and H. B. Gourlay took part.

A very full meeting of the Association was held in the University of British Columbia, on December 5th, when Dr. Whitnall, of McGill, delivered a most interesting lecture on "The Anatomy of Referred Pain." At the request of the Association, Dr. Whitnall also discussed the chiropractic situation as it presented itself to him recently at Victoria.

Fraser Valley Medical Society

Dr. E. J. Rothwell, President of the Fraser Valley Medical Society has resumed office work after a prolonged illness.

Dr. D. F. Carswell, who has been assisting Dr. Rothwell, has left on a trip for Kansas City.

Dr. George Wilson has returned from a three months trip to the East where he visited the large clinical centres.

The Society for the past two meetings has had a change from regular clinical addresses; all members of the Society who served overseas during the war giving short illustrated talks on the countries visited. The following doctors taking part: Drs. Manchester, Green, Clark, Wilson, Cannon and Purvis.

Victoria Medical Society

Dr. Milton G. Sturgis, also of Seattle, has recently read a paper on "Unrecognized Fracture of Spine."

The Society meets twice monthly, and a full programme for the winter session has been arranged.

Dr. H. T. Buckner, of Seattle, addressed the Victoria Medical Society on "Fractures" and showed many excellent mechanical appliances used by himself in treatment.

This Society has had several most interesting addresses since the annual meeting in October. At the annual meeting officers were elected as follows: President, Dr. H. M. Robertson; Vice President, Dr. M. J. Keys, and Hon. Secretary-Treasurer, Dr. M. W. Thomas.

Professor S. E. Whitnall, Reford Professor of Anatomy at McGill University, addressed the Society on November 30th and dealt with the nervous system and referred pain. Professor Whitnall was the guest of the Society at a luncheon at the Empress Hotel, on December 2nd. On this occasion he told the members of the newer studies in Anatomy. The profession in the "far West" is most appreciative of these opportunities to hear leading men from the larger centres and trust it will not be long before other teachers and leaders in the profession in the East will find it convenient to visit the Pacific Coast.

Professor Whitnall appeared before the Legislative Committee which has under consideration the proposed Chiropractic Bill introduced at the present session of the British Columbia Legislature. The expert evidence presented was much appreciated and the clarity and simplicity of the whole demonstration could not fail to impress the members who now possess a clearer understanding of the simple strength of the spine.

Obituary

The many friends of Dr. Robert W. Powell of Ottawa will learn with deep regret of the death of his wife on the evening of December the 29th, after a lingering illness.

Dr. William Jones, formerly of Hamilton, where he had practiced for nearly forty-five years, died suddenly in Toronto during November.

Dr. Ernest B. Boyes, formerly of Toronto, died in Denver, Colorado, on November the 7th.

Book Reviews

Animal Parasites and Human Disease. By Asa C. Chandler, M.S., Ph.D., Instructor in Biology, Rice Institute, Houston, Texas. Second Edition, revised. New York: John Wiley and Sons, Inc. London: Chapman and Hall, Limited, 1922.

This book professes to be a compilation and to be written for the general public rather than for medical men. It aims to supply readable information concerning the nature and importance to mankind of the animal parasites. In design, in arrangement of matter, and in its illustrations the volume is well adapted to its purpose. The references to current literature make it evident that the author has worked hard and read widely in order to bring up to date this second edition of his book.

While the volume is so praise-worthy, it still has defects. It is, perhaps, too large and too technical to be entirely successful as a popular exposition. On the other hand it is, occasionally, insufficiently exact in detail to be entirely successful as a text-book. If, perhaps, fifty pages were removed by the elision of certain unnecessary comments and surmises, the book would be more widely and warmly accepted as a classroom text book than it has been. There are passages where rather too enthusiastic acceptance of new, unconfirmed, observations and hypotheses gives wrong impressions.

On the whole, the book is one which should find a place in every medical library. Its author is to be congratulated on his production and upon the promise, inherent in this edition, of improvement and continued usefulness. J. L. T.

Manual of the Diseases of the Eye By Chas. H. May, M.D. Tenth Edition revised. 377 illustrations including 22 plates and 71 coloured figures. Price, $3.50. Published by William Wood Company, New York.

The author said in the preface to the first edition of this work, published twenty-two years ago, that he had endeavoured to give the fundamental facts of ophthalmology, and to cover all that is essential in this branch of medicine for students and general practitioners. This tenth edition, and the fact that the work is now published in almost every language of Western Europe, and in Japanese, and Chinese, prove that he has succeeded in his effort, probably beyond his dreams. It is a model book, comprehensive, accurate, and very readable. The coloured illustrations are perfection itself. One need not fear to recommend it, confident that the reader will find knowledge and wisdom in its pages, and profit and pleasure in their perusal.

Nothing but good can be said of it as an example of medical-book-making. F. C. T.

Ophthalmology, Retinoscopy, and Refraction By W. A. Fisher, M.D., F.A.C.S., with 248 illustrations including 48 coloured plates. Published by W. A. Fisher, 31 North State Street, Chicago.

This work is published with one purpose in mind; to teach the general practitioner, and the student, how to investigate eye-conditions and how to prescribe lenses for errors of refraction discovered. For those students who can work from a set of ideas and rules set down baldly in short form, as in paradigm, it will probably be successful; for those who need a story told, it will be disappointing.

The idea of the use of his pictures, published in the book, in a schematic eye, made according to his directions, is clever, and ought to be helpful. The text is orthodox. When the avowed plan is to make the physician feel at home in a comparatively, to him, unknown field, and at small expense to himself, (note the suggestion to have a carpenter make a schematic eye to use the pictures provided), one wonders what is gained by including the pictures of elaborate and expensive apparatus, which, even if helpful (a moot question), are luxuries which the physician will never require.

As a book of suggestions and rules, it has its field of usefulness, and if one would follow closely the directions regarding the use of the pictures, he will get a working knowledge of the commoner lesions of the posterior segment, which is all the author claims for it. The book-making including the colour work is about up to the average standard, which is perhaps all one should expect. F. C. T.

The Prescriber. A monthly journal devoted to Therapeutics and Treatment. Annual Subscription, 20s. Single copies, 2s. Edinburgh, 6 South Charlotte St. Canadian Agents, McAinsh and Co.

The October number of *The Prescriber* is devoted to the subject of Endocrinology and deals specifically with the thyroid and parathyroids. In addition to editorial articles upon these glands there are several excellent original communications covering special aspects of thyroid and parathyroid therapy. The tests for thyroid activity are detailed in a manner to make them clearly understood and there is a good presentation of how to prescribe the glands in practice. A valuable feature of the number is the section of abstracts from recent literature. For reference there is a good working list of the important books on the thyroid gland and a bibliographic index of the literature of 1921-22.

The editor is to be congratulated upon this special number which is quite up to the standard of *The Prescriber's* other special numbers of recent years. It forms a splendid reference work for the physician, and its perusal will place him *au fait* with thyroid and parathyroid therapy. Surgical treatment and technique are not discussed. Graves' disease appears to be considered more and more a medical rather than a surgical disease. J. H. E.

Ophthalmic Surgery By Major V. Nesfield, F.R.C.S., 172 pages with 22 illustrations, price 9s. net. Published by H. K. Lewis Co., 28 Gower Place, London, 1922.

This small volume has provided for me the most delightful reading of surgery, I have enjoyed for many a day. In its one hundred and sixty pages are condensed ideas crystallized out of years of very extensive surgical practice in India. The author just talks to us; has the rare faculty of making himself present while we listen, for one seems to read these pages with his ears. Then he speaks out with conviction; all through the book is found the spirit shown in the remark regarding treatment of advancing infective corneal ulceration, 'The division of the base of the ulcer (Sarmisch's section) is wrong, and very unsound practice, etc.' You will not agree with all he says, but therein lies much of the charm of the book. You will meet a man who has ideas of his own; in his preface he says, 'the work will be found somewhat unorthodox'.

The work of the publisher is almost beyond compare; the paper, type, and spacing are ideal; the book is light in the hand, the binding substantial and attractive, and one wonders why all medical books are not published after so excellent a model. F. C. T.

Encephalitis Lethargica By Dr. Achard, Professor of Clinical Medicine in the Faculty of Medicine of Paris, one volume, 324 pages with 15 illustrations, 16 francs. (Librairie J. B. Balliere et fils, editeurs, a Paris, 19 Rue HautreFenille).

This book, by Dr. Achard is the most extensive and complete work published on this terrible and baffling malady and merits the study of every physician—and we trust than an English edition will be made available so that its wealth of clinical observations and reasoned conclusions may be at the disposal of a wider circle of students. The table of contents is as follows: 1. History. 2. Study of the Symptoms. 3. Clinical aspects and progress of the malady. 4. The lesions of the malady and the interpretation of the symptoms. 5. The virus and its propagation. 6. The comparison of encephalitis lethargica with other morbid states. 7. Diagnosis. 8. Prognosis. 9. Treatment. 10. Bibliography.

In the study of the Symptoms—Chapter 2, the author emphasizes the clinical diversity of the manifestations of the disease—not only in the course of different cases but during the progressive stages of individual cases; among these, however, are always in the first rank the nervous phenomena—psychic, motor and sensory.

The psychic symptoms include somnolence, often profound but often and characteristically, so light that the patient responds to questions uttered in a loud voice: or the ambulatory type where the patient follows his ordinary occupation, but falls asleep at intervals when resting. In vivid distinction are cases recited, falling into a narcolepsy while playing the violin or while writing a letter. Another type is graphically described as "l'etonnement." "The patient is not asleep; he has his eyes open, and is capable even of sitting up, of holding the head erect, but he remains immobile, his features as if fixed: his physiognomy gives the impression of a mask, his eyelids drooping, his eyes do not follow articles moved before him: and, nevertheless he understands what is said to him and can recount it when he recovers his faculties." Sometimes it is not depression but excitement, delirium, agitation, which are present, but these are usually associated with torpor, though cases of frank mania even suicidal or resembling Karsahoff's Syndrome or delirium tremens are found with true hallucinations. The motor troubles include notably ocular paralysis, most frequently of the third pair, ptosis, strabismus and dyplopia, less commonly nystagmus, mydriasis, inequality of pupils, paralysis of accommodation, Argyll-Robertson pupil. The author has found such paralysis present in seventy-five per cent. of cases and believes that even a larger proportion would be found if all cases were seen in the early stages. Other paralyses are of the seventh pari, the muscles of the neck, hemiplegias and paraplegias incomplete or complete, hypotony of the muscular system reminiscent of tabes and with diminution of faradic excitability.

The clinical aspects are illustrated by the full description of a great number of cases in which every possible type is cited, the limits of space forbid quotation, but the pathological findings are of great importance.

In the gross, meningeal haemorrhages while found are not common, while suffusion is frequent; in the brain are petechial haemorrhages and reddening of the choroid plexus, the site is most often in the bulb, about the aque duct of Sylvius and in the neighbourhood of the locus niger. Microscopically are found vascular and perivascular lesions, chiefly as Marinesco has noted, on the venous side of the capillary field with masses of cells, lymphocytes in the majority, but also mononuclears, plasmocytes and fibroblasts, cells containing a mass of central chromatin and plasmatic bodies staining with unna's blue. In the vicinity of the vessels may be seen degenerated myelen and cells bearing sudanophila fat, and blood pigment in macrophages, the lesions again showing a predilection for the locus niger which may be decolourized and for the grey nuclei of the nerves. A very complete study is made of the relation of the lesions to the symptoms and the site of election of the lesions in the anatomical structure of the brain which is most illuminating to the clinician as well as to the pathologist, but is too extensive for condensation here.

Experimentation has proved the existence of a filtrable virus, virulent for the rabbit and some other animals, which may be derived from the brain, an active virus has also been obtained from the nasopharyngeal secretions which gives support to the theory that the path of infection is through the upper air passages and supports the clinical observation that the malady is frequently preceded by marked coryza and catarrh and the author concludes that there is a primary septicalmis phase of an organism with a predilection for the nervous structures, as in syphilis, trypanosomiasis and sleeping sickness. The epidemiology of the disease is discussed and while admitting that its contagion is limited, probably existing only in the primary stage, yet a number of striking examples are quoted where it has been disseminated, Netter quoting 114 families with at least two cases in each.

The chapter on treatment contains nothing encouraging, the value of the serum of convalescents is doubtful and it may well be dangerous in spite of the proof of active inhibition in animal experiments of corneal implantation. The use of other sera, foreign proteins, subcutaneous injection of milk, etc., have not been attended with constant success; the formation of a local abscess by the injection of turpentine is mentioned and the use of a variety of sedatives, but the amelioration claimed in some cases has not been found in other and we still await a reliable means of combatting, this most alarming recruit to the armies of death. A. J. M.

Improvements in Preoperative and Postoperative Care.—The essential point made by F. B. Taylor, W. I. Terry and W. C. Alvarez, San Francisco, is that in a large hospital with young and inexperienced house officers, the standing orders should call for as little meddlesome interference as possible. If any patient develops symptoms which require the use of purges or enemas, they can always be prescribed; but they should not be made compulsory for the patient who is convalescing smoothly and rapidly. Furthermore, the standing orders must not be such that the very life of a man coming in with an acute intestinal obstruction, a perforating appendix or a gangrenous Meckel's diverticulum must depend on the intervention of some intelligent intern or resident. The salient points in the treatment endorsed by the authors are: (1) The omission of the preoperative purge had no definite influence on the amount of vomiting, but it had a decided effect on the amount of pain in the abdominal cases, reducing its incidence from seventy-five to forty-two per cent.; (2) the delay in giving the postoperative purge had a decided effect on the amount of vomiting, reducing its incidence from forty-five to thirty per cent. in the abdominal group, and from twenty to forty per cent. in the extra-abdominal group; (3) in both groups, there was more complaint of pain when the postoperative purges and enemas were withheld.—*Jour. Am. Med. Assoc.*, November 4th, 1922.

Books Received

The Cleveland Hospital and Health Survey. Published by the Cleveland Hospital Council, 602 Electric Building, Cleveland, Ohio.

Syphilis By Burton Peter Thom, M.D. 525 pages, with 69 engravings. Price, $5.50. Published by Lea and Febiger, Philadelphia and New York, 1922.

Ophthalmic Surgery By Major V. Nesfield, F.R.C.S. 172 pages, with 22 illustrations. Price, 9s. net. Published by H. K. Lewis and Co., 28 Gower Place, London, W.C.I., 1922.

Diseases of the Heart. A hand book for students and practitioners. By I. Harris, M.D., L.R.C.P. (Ed.) 196 pages, with 50 figures in the text, price 10/6 net. Published by Bailliere, Tindall and Cox, 8 Henrietta Street, Covent Garden, London, Eng.

Medical History of the War—Medical Services: General History Volume 1. Edited by Major General Sir W. G. MacPherson, K.C.M.G., C.B., LL.D. Published by His Majesty's Stationery Office, Princes Street, Westminster, S.W.I.

Stedman's Medical Dictionary. By Thomss Lathrop Stedman, A.M., M.D., seventh revised edition. Illustrated. Price $7.00 net. Published by Messrs. William Wood and Company, 51 Fifth Avenue, New York.

Medical History of the War.—Medical Services: Diseases of the War—Volume 1. Edited by Major Gen. Sir. W. G. MacPherson, K.C.M.G., C.B., Major General Sir. W. P. Herringham, K.C.M.G., C.B., Colonel T. R. Elliott, C.B.E., D.S.O., and Lieut. Col. A. Balfour, C.B., C.M.G. Price, 22 shillings. Published by His Majesty's Stationery Office, Princes Street, Westminster, S.W.I.

A Text Book on Minor Surgery By John C. Vaughan, M.D., and Athel Campbell Burnham, M.D. 605 pages, illustrated with 459 engravings. Price, $7.75. Published by Lea and Febiger, Philadelphia and New York, 1922.

Pulmonary Tuberculosis By Maurice Fishberg, M.D. Third edition, revised and enlarged. 891 pages, illustrated with 129 engravings and 28 plates. Price, $8.50. Published by Lea and Febiger, Philadelphia and New York, 1922.

Lessons in Pathological Histology By Gustave Roussy and Ivan Bertrand. Translated from the second French edition by Joseph McFarland, M.D., Sc.D. 278 pages, illustrated with 124 engravings. Price, $3.25. Published by Lea and Febiger, Philadelphia and New York, 1922.

A Practical Hand Book on the Diseases of Children. By Bernard Myers, C.M.G., M.D., M.R.C.P. 548 pages, with 61 illustrations. Price, 21s. net. Published by H. K. Lewis and Co., 28 Gower Place, London, W.C.I., 1922.

Lawson Tait—His Life and Work A contribution to the history of abdominal surgery and gynaecology. By W. J. Stewart McKay, M.B., M.Ch., B.Sc. 578 pages, 34 plates. Price, 25s. Published by Bailliere, Tindall and Cox, 8 Henrietta Street, Covent Garden, London.

Medical History of the War—Medical Services: Surgery of the War Volume 1. Edited by Major General W. G. MacPherson, K.C.M.G., C.B., LL.D., Major General Sir A. A. Bowlby, K.C.B., K.C.M.G., K.C.V.O., Major General Sir Cuthbert Wallace, K.C.M.G., C.B., and Colonel Sir Crisp English, K.C.M.G. Price, 26 sh. Published by His Majesty's Stationery Office, Princes Street, Westminster, S.W.I.

Value of Rest in Cases of Empyema and Lung Abscess.—J. S. Pritchard, Battle Creek, Mich., endorses the value of other methods of treatment of empyema and lung abscess, such as postural treatment, pneumothorax, irrigation, vaccine, medication, artificial light therapy and surgery; but, he asserts, with the addition of rest and hygienic treatment, more gratifying results may be obtained. Many nontuberculous conditions of the lungs and pleura may be greatly benefitted if the patient is given the rest regimen now employed in cases of acute pulmonary tuberculosis. In the series of twenty-one cases of pulmonary abscess (acute and chronic) reported by Pritchard, ten followed tonsillectomy under general anaesthesia. He is convinced that a more prolonged rest in bed following thoracotomy in empyema would result in the development of fewer chronic cases. The rest treatment does not cause the strength of the patient to decrease; it relaxes the nervous system, augments nutrition, and increases the general resistance. Some study may be necessary to reestablish the patient's confidence, but in many instances a recovery from a much more serious affection than pulmonary tuberculosis has taken place.—Jour. Am. Med. Assoc., December 30th, 1922.

ESSAYS AND LECTURES ON CLINICAL SURGERY

By DOCTOR A. MACKENZIE FORBES, Clinical Professor of Orthopaedic Surgery, McGill University.

The Canadian Medical Association Journal says:—"This book is a very readable one. Every page is full of useful information. To the student and to the general practitioner it can be strongly recommended."

Price $2.00. For sale by MISS POOLE, 45 McGill College Avenue, Montreal.

Sexuality in Children.—Friedjung protests against the prejudices and disregard of one's own childhood experiences in the placid assumption that childhood is asexual or presexual. The tremendous changes at puberty do not come out of nothing; there has been a gradual development up to this stage. He has been collecting material in this line for ten years, and presents examples of three types of erotic manifestations in normal children, those connected with the child's own person, with the person of another, and those in the psychosexual sphere. He includes in the first type, the *autoerotik* the pleasurable sensation which is a factor in the child's sucking the breast. Some infants suck their fingers even a few minutes after birth. The child does not learn to suck to get food, but it gets the milk as an unexpected by-effect of its erotic sensation from the sucking movements. He agrees with Freud that the mouth is one of the erogenous zones, relating an example of thumb-sucking continued into married life, and one of the factors in the divorce. The erotic sensations from rhythmic movements, rocking, etc., belong in this category, as also those connected with defecation and urination. The urethra is another erogenous zone; many cases of enuresis are traceable to this. He has witnessed erection in a 3 weeks' infant, and the daily necessary washing of the genitals attracts the infant's attention to this region. If the cleansing is neglected, then itching and smarting have the same effect. Perhaps, he suggests, it is a functional necessity for the attention to be called early to this biologically important organ. He gives instances of habitual onanism in infants of 9 and 13 months, and says that as the children grow older and are chided for it, they merely become secretive, both girls and boys. He has never seen any severe injury result from the masturbation which is so frequent preceding puberty. He gives a number of examples of *herteroerotik*, including the case of a boy of 3½ with erections when taken into bed with his young mother, and a girl of 2 who, taken into her father's bed, hugged and kissed him and suddenly urinated. A number of instances of Freud's Oedipus complex in very young children are related, and examples showing the craving of children of even 3 and 4 to learn where babies come from. He reiterates in conclusion that all the examples he cites are of normal children whose further development he has followed for years, some into mature life. Physicians are constantly asked for advice in this field, and they can tranquillize and advise and ward off danger if they do not wilfully close their eyes to experience.—*Zeitschrift fur Kunderheilkunde*, Nov. 22nd, 1921.

Palliative Trephining for Pressure on the Brain.—Anschütz (Deut. med. Woch., October 20th, 1922, p. 1,406) reviews the results achieved in the fifty cases in which he trephined for the relief of pressure symptoms. He admits that the diagnosis of cerebral tumour is far from easy, and in one of his cases, in which cerebellar trephining was performed for the relief of pressure (cerebro-spinal fluid under a pressure of 700 mm.) and for severe congestion papillitis, the necropsy failed to show any pathological change in the brain. The author classifies his material according to the height of the pressure of the cerebro-spinal fluid: in seven cases it was up to 300 mm., and at the other extreme there were seven cases in which it was over 600 mm. The latter class represented hopeless cases. Among the remaining forty-three cases there were six deaths, one from meningitis. In addition to these six operative fatalities and six cases which could not be traced, there were ten cases in which the operation gave relief, but death occurred within a year. The author concludes that, though palliative trephining is almost invariably useless when high pressure and coma have lasted some time, it may be strikingly successful in averting blindness and prolonging life when the symptoms are due to slowly growing malignant disease. The results are still better when new growths are of a stationary character, and the author records the case of a man suffering from a glioma the size of a plum in the optic thalamus and a malignant adenoma of the pituitary body. Palliative trephining not only reduced the intracerebral pressure, but restored his eyesight and general working capacity, and it was not till nearly eleven years after the operation that he died from influenzal pneumonia, and the diagnosis of tumour of the brain was confirmed. The author's technique is practically identical with that followed by Cushing for subtemporal trephining.—Brit. Med. Jour., December 16th, 1922.

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CANADIAN SOCIETY OF ANAESTHETISTS

THIRD ANNUAL MEETING

June 12th., 13th., and 14th., 1923

Jointly with the
CANADIAN MEDICAL ASSOCIATION
at the
MOUNT ROYAL HOTEL, MONTREAL

The programme will include demonstrations in the Laboratories of McGill University, anaesthesia clinics in the Hospitals of Montreal, and papers by prominent research workers and leading anaesthetists.

The visiting ladies will be especially entertained.

Further information may be obtained from

WESLEY BOURNE, *Secretary-Treasurer,*
34 ST. MARK STREET, MONTREAL

THE IMPORTANCE OF THE EMOTIONAL OR PSYCHICAL NATURE OF PEOPLE IN GENERAL IN THE PRACTICE OF MEDICINE IN ITS WIDEST SENSE*

Alexander McPhedran, M.D., LL.D.

Toronto

THAT the psychical or emotional condition has much influence on patients generally must be evident to anyone who gives it consideration. In the daily life of all it plays its part in affecting the outlook. We have only to observe the effect of disappointment, fear, and joy to make plain this fact. Is it not well illustrated in the child who is relieved by the "kiss to make it well?" and "we are but children of larger growth." As a matter of fact, the unrelieved disturbed emotional condition may and often has serious effect on both mental and physical health which may lead to dire consequences. This is strikingly shown in the many cases resulting from the war. Notwithstanding this, it receives scant consideration in the practice of medicine. This is due chiefly to a defect in the training of the student before graduation and its effect in his practice after. As a result of education the practice of medicine in the past was confined to physical ailments, and for their relief, drugs, too often unpleasant and often drastic, were relied on. To this homeopathy chiefly owed its origin; its decay has kept pace with the rise and progress of rational medicine. In this progress, general medicine has been still concerned with physical diseases, mental and psychical affections being relegated to the alienists who have now adopted the name psychiatrists, though still too often confining their attention to mental disturbances.

Ailments of emotional origin may affect any function of the body and cause as great a variety of symptoms, such as slight or severe pains, loss of weight and vigour, insomnia, disturbed digestion, marked constipation and many others. In the war cases, in addition to milder complaints, were blindness, deafness, paralysis, aphasia, loss of memory, etc. In civil life these severe effects have been met with but the vast majority are milder. The physician's attention is usually focussed on the symptoms of which most complaint is made and a physical cause is sought for, the possible psychical cause receiving no consideration. In some cases without a local complaint it may be difficult to trace to their origin and make sure of their cause and relationship to the symptoms. There may be a secret sorrow which they will not reveal; others enjoy their ill health too much to give up the key to the problem. In many if not most cases, however, the psychical disturbance is easily discerned if its possible existence is only kept in mind. Once found, an assurance of relief will usually gain the confidence and coöperation of the patient, and with satisfactory results; especially, if there is a strong wish to get well. In such cases, the charlatan often has the advantage. He does not concern himself with history or examination but announces a simple cause that rarely exists and gives assurance of a prompt cure. If he secures the confidence and cooperation of the patient, as he usually does because he appeals to his vanity, the symptoms are often promptly relieved. It is the psychical impression, not the means used, that affects the cure. This is aptly illustrated by the following instance. A woman, suffering much discomfort and anxiety regarded as due to pelvic lesions, had these repaired by a capable surgeon who assured her that she should be now quite relieved and there was no occasion for worry But she felt no better, in fact grew worse until she fell in with one of the cults who assured her she would get well under her treatment and she did so very quickly. Had her physician recognized and treated the psychical trouble she probably would have recovered without operation although it also should have been done.

In the great war, the large number of cases of neuroses caused by mental, emotional and physical shock and overstrain and the horror through which the soldiers had passed, forced on the medical staff the necessity of the study of these cases and with phenomenal results. Reassuring suggestion played the greatest part in the recoveries. Naturally this has given an impetus to the study of like cases in civil life. In the latter, the onset of symptoms is seldom sudden as severe shocks are rare; usually its beginning is inappreciable and its course slow, and the cause maybe discoverable only by patient investigation. Most of the cases owe their origin to long continued unhappiness, fears, anxiety, worry and overwork with their physical effects; of these probably the first named is the most frequent and potent cause. It is necessary, therefore, to be alive to the fact that psychical disturbances may be the sole cause of the ill-health and at the same time give rise to marked symptoms associated with one or more organs. Also that in all chronic diseases especially, the symptoms are always increased. often seriously, by the patient's fears and anxiety.

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*An abstract of addresses given in Winnipeg, Edmonton, Calgary and Vancouver during the last summer.

That there is neglect of due attention to the emotional disturbances of people all who consider it will agree. The cause of this neglect lies chiefly at the door of medical education. Clinical training in the hospitals has dealt almost exclusively with physical ailments, the emphasis being laid on physical examinations with history relegated to a second place, and worse still, in a resort to the laboratory, especially the x-ray examination, before a full history is obtained and a proper physical examination made. Sound training requires that the greatest importance be placed on the patient's history and it should include the mental and psychical as well as the physical. If this were done, few physicians would ignore the emotions or feelings of the patient to the detriment of the patient's well being as well as the physician's prestige.

This widespread neglect by the profession not only injures its reputation and causes material loss, but forms the very basis for the birth and growth of the various cults that infest the land. The chief, if not the sole, cause of their existence is the failure of the profession to meet fully the psychical as well as the physical needs of the public. It is on the emotional ills of people that the cults live and flourish. They appeal to the psychical nature without knowing it, through their various fads, whether "spinal adjustment" or other. That the cause they assign for the patient's trouble only exists in the adjuster's mind, or forms a cloak for ignorance, is of no moment; that it appeals to the patient suffices to make a psychical impression that gives confidence which may relieve anxiety, and recovery follows. Such cases are met with almost daily in the experience of every physician and can usually be recognized by a little careful inquiry. It is a mistake to regard these ailments as imaginary. Gastric pain due to a psychical cause is just as real as a pain due to ulcer, and in the patient's opinion its relief is just as imperative. The object of our existence as a profession is to lead the way in prevention of diseases, to cure patients when possible and to relieve when this cannot be done. Our contract with our patients is to cure them and in this effort we are under obligation to use any and all means to attain that object whether the illness is physical, mental or emotional, or all of them. If we fail to use the means necessary for relief they will go elsewhere in the hope of getting it, and that hope in itself is often half the cure.

The most difficult are those with no local discomfort to indicate a probable cause of the psychical trouble. The cause has to be ferreted out and this can be done only by securing the confidence and cooperation of the patient, a difficult problem in not a few. It was in such war cases that loss of memory, speech, hearing etc. developed, and, worse still, the depressed and those showing psychical aberrations; in many of these cases the psychical balance was unstable and some were probably more or less affected before the war. As soon as the physicians understood these cases and applied proper treatment, marvellous results followed. Patients in civil life are rarely so severe and dramatic as the war cases, yet their suffering is just as real and relief is just as urgent. The following is a good illustration: a woman with persistent epigastric pain, due, she was told, to ulcer, was anxious to be relieved quickly as she had arranged to go on a European tour in a couple of weeks. Even water caused pain, sufficient of itself to prove that it was not due to ulcer. After careful examination she was assured that she could go if she obyed instructions; this she agreed to with alacrity. She was placed under good nursing care, told to ignore her gastric pain, to eat what was set before her and, as she was constipated, to go to the toilet precisely half an hour after breakfast, forgetting the constipation. The result was that she took full meals daily without discomfort and the bowels moved freely. She gained a pound a day, went to Europe and on her return told her nurses that she was quite well. Her great anxiety to be relieved formed conditions ideal for the success of psychical treatment.

Another case is that of a young woman of high colour and apparently well-nourished; that is, fat enough. Her sister had chronic tuberculosis and she was in daily fear of becoming infected. Haemoglobin was low and strength poor. She had been given Zambilletti's fluid hypodermically for some time, the blood improving, but it had become low again. Her diet was composed almost wholly of carbohydrates. With properly apportioned diet, increasing outdoor exercises as she grew stronger, and assurance that there was no danger of infection if proper care were taken, she was soon quite well. Zambelletti's fluid is good, but proper food is better, neither would have succeeded without the psychical change.

Of the diseases in which psychical symptoms always co-exist, one of the most important is exophthalmic goitre. The psychical disturbance probably always precedes, and is always present at the onset of the attack. Of the exact pathological condition there is still doubt. As the psychical symptoms usually precede and are always present in the disease, and in an increasing degree as the attack grows worse, it is justifiable to regard the psychical condition as a contributing, if not the chief cause of the disease. That it should be so regarded is further supported by the fact that many, if not most cases will recover under judicious treatment. To carry this out, isolation under proper conditions to afford psychical and physical rest, capable nursing, good food, and close encouraging medical attendance is essential. If this course is carried out efficiently it is probable that few would require surgical aid. The disease is evidently a nervous one with marked functional disturbance hence the imperative necessity of physical and emotional rest and encouraging suggestion.

"Nervous breakdown" is a very common complaint; and many take a real pride in telling that they have had it, especially if there have been several attacks. They roll the term "under their tongues like a sweet morsel." I often feel it a misfortune that the term was ever coined. In this condition, the emotional element has a large part if it is not the sole cause. In cases in which recurrence of the attacks takes place the emotional balance has been only improved, not restored in the intervals of apparent recovery. In such, a painstaking search should be made of the history for its unhappiness, worries, anxieties and disappointments; some one or more of them will be found. To effect a cure they must be removed; if that is impossible, the circumstances must be faced with renewed courage so as to be patiently endured, if they cannot be ignored.

The following case seen many years ago is interesting. A young married woman had been in bed for a year without any cause to be found for her invalidism. Her best dressing gown was placed on a chair beside her bed and she was asked to put it on and sit in this while we were downstairs for further consultation. On returning, she was sitting dressed in the gown. It was then suggested that she drive down to the shopping district to see the people. This she did. After that she resumed her usual life of activity.

In all acute diseases, pneumonia, typhoid, sepsis, etc., the emotions have their part. The people reported as "making a brave fight," are those whose emotions are under good control and do not therefore lessen the physical resistance. The man who can calmly face the gravest possibilities conserves his resources to the utmost. It is the surgeon's as the physician's duty to aid in preserving the emotional calm.

We all have known physicians of little knowledge and training who have been successful practitioners because of their optimism and readiness in assuring patients of their recovery, in this manner impressing the patient's psychical condition by raising hope and restoring courage. They have often been the most honest and genial of men. It is necessary to remember that a vast number of the milder ailments, with as well as without local physical symptoms, will recover in a shorter or longer time even without treatment. The psychical nearly always plays a major role. It is from this class, especially the rich, that the cults largely draw their patronage and their sustenance. They will continue to do so as long as physicians fail to recognize their psychical troubles and do not adopt proper means for their relief.

The contrary aspect of the matter merits comment in closing. In any serious disease the psychical symptoms may be so marked as to overshadow those of serious physical disease. This is especially true of tumour of the brain, circulatory diseases, renal disease with uraemia, etc. Each and all of them may have the emotional symptoms so marked as even to mislead the most expert. This is usually due to imperfect examination made often in conditions rendering a more perfect one impossible. Under such circumstances a diagnosis should await the opportunity of a full examination.

The object borne in mind in these addresses was to press on the family physicians throughout Canada, the most important and deserving body in the profession, the need of attention to this much neglected field, but it is hoped that specialists in general, including surgeons, will give consideration to this important matter.

ACHES AND PAINS OF RENAL ORIGIN*

ANDREW FULLERTON, C.B., C.M.G.

Belfast, Ireland

EVERY practitioner is confronted from time to time with the problem of aches and pains which raise a suspicion of some disorder of the kidney, and my intention in this address is to record my own difficulties in diagnosis, and the methods adopted to surmount them. I have gone carefully through the records of upwards of 1,500 successive cases of cystoscopy of which I have notes, and picked out those in which pain was complained of, with a view to ascertain whether the condition of the kidney or ureter or the site of the lesion could be correlated with pain of a particular type or distribution. The results of these observations show, on the one hand, that the most extensive disease of the kidney may exist without any pain whatever, and, on the other, that a very slight departure from the normal may be associated with almost unbearable agony; also that a precisely similar condition may, in one patient, give rise to the merest local discomfort, and in another to pain of a severe character, radiating to the utmost terminations of the peripheral nerves. I have in my mind at the moment a man who used to bring in a small bottle a number of small calculi passed with the minimum of discomfort. Any one of these small calculi would be capable in another patient of producing the most intense renal colic.

Papin and Ambard in a recent article ("Etude sur l'Enervation des Reins," published in "Archives des Maladies des Reins et des Organes Génitaux-Urinaires," Tome I, No. I, Paris, 1st April, 1922) give some interesting facts bearing on renal pain and its treatment, which will be referred to later.

It will be convenient at this stage to review briefly the nerve supply of the kidney and its pelvis. The kidney receives its chief nerve supply through the renal plexus which accompanies the great vessels into the hilum. Branches also accompany the vessels to the capsule and accessory vessels, when the latter exist. The renal plexus comes off from the solar plexus, which is composed of a network of nerves and ganglia lying between the terminations of the great splanchnics of either side. The great splanchnic is formed by branches coming from the 6th to 10th thoracic ganglia, receiving filaments (according to Beck) from all the thoracic ganglia above the 6th. It terminates in the semilunar ganglion, which also received the pneumo-gastric and filaments from the phrenic. The small splanchnic, which is sometimes double, is formed by filaments from the 10th, 11th, and 12th ganglia and terminates either in the semilunar ganglion or passes directly into the renal plexus. The renal plexus is formed from branches issuing from the semilunar ganglia, the small splanchnics, and sometimes from the great splanchnics; it also receives a branch from the first lumbar ganglion. The plexus is composed of filaments and ganglia. The filaments follow the course of the vessels, around which they form a close network. In the kidney itself the nerves follow the blood vessels as far as their most remote terminations, and have been traced to the vascular tuft of the glomerulus. Other branches are distributed to the uriniferous tubules. Sensitive end organs have also been described in the muscular walls of the pelvis and calices, in the tunica adventitia and tunica media of the vessels, and in the capsule of the kidney. The nerves to the kidney itself are, with few exceptions, nonmedullated, while those distributed to the pelvis and calices are for the most part medullated. The cells met with in the ganglia of the renal plexus are of the sympathetic type. It appears probable that renal pain proceeds from the sympathetic. According to Wundt the cells of the sympathetic oppose an obstacle to impressions, only overcome when these are of a violent nature. It is held by many authorities that painful sensations in the sympathetic system are really only perceived on quitting that system and gaining, by way of the rami communicantes, the posterior roots of the cord, and, through these, the cerebro-spinal centres. The result of this is that pain is often reflected along the course of nerves connected with the corresponding rami communicantes. Section of the spinal cord be-

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*Read before the Academy of Medicine, Toronto, October 12th, 1922 tween the 8th and 9th dorsal segments abolishes the sensibility of the kidney and ureter. Section of both splanchnics does not abolish the sensibility of either kidney or ureter. The pneumogastric takes no part in the conduction of renal pain.

We are now in a position to refer to the question of how far the kidney, pelvis and ureter are sensitive to various stimuli. Pressure on the normal kidney produces pain of a sickening character somewhat similar to, but much less severe than that produced by pressure on the testis or ovary. When an operation is performed on the kidney under local anaesthesia manipulation of the organ produces pain. The sensitiveness of the kidney to heat and cold has not been fully investigated, but would appear to be slight. Puncture and section of the kidney are apparently not specially painful. Manipulations, however, carried out on the pedicle, and, especially, stripping back of the peritoneum, are attended with pain. Compared with the kidney the pelvis and ureter are highly sensitive. The patient is often cognisant of the presence of the ureteral catheter in the pelvis of the kidney, and if the former is pushed too far pain may be produced. Hot and cold fluids introduced through the ureteral catheter are not clearly perceived as such. Distension of the pelvis, however, is very definitely painful. If more than 3 to 7 c.c. of fluid are injected into a normal pelvis, pain resembling renal colic is, as a rule, provoked, and may at once be relieved by draining off the fluid injected. Pyelic pain may be very accurately studied by pyelography, or by simply measuring the capacity of the pelvis by the injection of fluid. The pain produced by distension of the pelvis commences in the subcostal region in the anterior axillary line. Tender points can be demonstrated by touch in the costo-lumbar, sub-costal, para-umbilical and iliac regions. These areas are those to which pain is referred by the cerebro-spinal nerves from impressions received by the sympathetic. Pain may be referred along the course of the nerves of the lumbar plexus towards the thigh, the testicle or the labia majora, or it may be referred to the epigastrium or the renal region of the opposite side. Zones of cutaneous hyperaesthesia may be demonstrated by stroking or pinching the skin. The tenth, eleventh and twelfth dorsal segments correspond in part to the kidney: the eleventh, twelfth dorsal, and first lumbar correspond to the pelvis and ureter. Certain reflex phenomena such as nausea, vomiting, and pallor, with cold sweats, unassociated with disturbance of pulse or respiration, commonly accompany pyelic pain. In pathological conditions the sensitiveness of the kidney and ureter may be profoundly altered. Papin and Ambard* classify renal and pyelic pain as follows:

1. That due to mechanical or traumatic causes.
2. That due to inflammatory conditions.

The mechanical causes are:

(a) Distension of the ureter, pelvis and calices.

(b) Distension of the parenchyma in the capsule by congestion or oedema of the kidney.

(c) Contact of a foreign body with the walls of the pelvis or calices.

(d) Dragging of the pedicle of the kidney.

(e) Compression of nerves. Most of the pain is, however, reflex or of a toxic nature.

(f) Sclerosis of the kidney.

The inflammatory causes are:

(a) Lesions of the pelvis and calices, such as pyonephrosis.

(b) Lesions of the parenchyma, such as pyelonephritis.

(c) Lesions of the perirenal cellular tissue, such as perinephritis and perinephritic abscess.

These authors are of opinion that renal pain is usually, as a matter of fact, pyelic. In calculus, hydronephrosis, movable kidney, renal tuberculosis, cancer and renal haematuria, obstruction of the ureter declares itself by renal colic due to distension of the pelvis.

Pain in the kidney itself is generally of moderate intensity except in inflammatory lesions when it may become very severe.

It is very instructive, when one is constantly seeing cases of urinary disease, to record in the patient's own words his description of the pain he suffers. A collection of such accounts is of great interest, especially if the case is followed to its termination by operation, or in the post mortem room. A study on these lines shows that the most varied pathological conditions may give rise to almost identical symptoms. This supports the suggestion that a common cause may be present in all, namely, distension of the renal pelvis from some obstruction. This obstruction may be a calculus, a kink, a thickened ureter, or a blood clot. Except when obstruction is present, there does not appear to be any positive pressure in the pelvis. A proof of this is that

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**Loc. cit.*

when for any reason an incision is made into the pelvis of the kidney—say, for the removal of a stone—close, accurate, watertight suturing is not absolutely necessary to prevent leakage. The urine seems to trickle down the walls of the pelvis, as rain down the roof of a house, and, if no obstruction is present, finds its way into the upper part of the ureter, where peristalsis begins and forces it towards the bladder. If the obstruction has not been relieved, leakage will take place. It is reasonable to suppose that the peristaltic movements of the ureter, if excessive, may be painful, just as those of the bile ducts and intestinal tube may be. Efforts by the ureter to pass on a calculus or to overcome an obstruction are probably attended with pain, but an investigation of cases with the most intense renal colic radiating even to the toes, shows that the obstruction is quite frequently at the uretero-pelvic junction, hardly, if at all, involving the ureter. It is, of course, possible that spasm, started in the pelvis, may be transmitted along the ureter, and one does observe movements at the ureteral orifice in certain cases in which there is no efflux.

Renal pain or pyelic pain may be so slight as to pass almost unnoticed, or it may be of the most violent character. It may remain in one spot, or it may radiate widely. It may start suddenly or gradually, and may terminate in the same way. It may only last for a few seconds, or it may continue for hours. It may occur in attacks, with intervals of complete or comparative freedom, or it may be more or less constant. It may come on during exercise, or when the patient is resting quietly in bed. It is variously described as a sense of discomfort, an ache, a gnawing or burning sensation, a bursting feeling, or a feeling of fulness, a stab, a tearing or cutting sensation. The intensity of the pain is no index whatever of the severity of the lesion. A minute calculus may produce the most severe agony, whilst one the size of a chestnut may give very little indication of its presence. A very slight kink of the ureter may produce more pain than an extensive hydronephrosis.

The direction of the radiation of the pain is, as a rule, towards the lower extremity, generally to the groin, the testis or labia majora, sometimes into the upper part of the thigh, more rarely to the knee and the leg, even as far as the toes. Occasionally, however, radiation takes place towards the upper extremity, to the shoulder, arm and fingers. Not infrequently the pain radiates to the opposite renal region, and occasionally is felt solely on the presumably healthy side. Reference has already been made to reflex nausea, vomiting, pallor and cold sweats. A special variety of pain is that seen in some cases of movable kidney, and called Dietl's crises. The pain in these cases may be due to torsion of the pedicle, kinking of the ureter, or dragging upon the pylorus, gall-bladder or other abdominal structure. It may be suggestive of an acute abdomen with rigidity, or may be of the type already referred to in discussing distension of the renal pelvis.

A typical attack of renal colic is so characteristic that a diagnosis of something pathological in the kidney or ureter is justified, and yet the surgeon will occasionally encounter cases in which every examination that can be made fails to establish a diagnosis, and one is driven to enquire whether extra-renal conditions may not in exceptional cases give rise to colic that is with difficulty distinguished from that due to renal causes. It is important to ascertain if the site of the pain or areas of hyperaesthesia, lumbar, subcostal, paraumbilical, iliac, etc., give any clue to the position of the causative factor. My own observations lead me to the conclusion that it is unsafe to predict from these symptoms alone the situation of the lesion. In back pressure from an enlarged prostate, for instance, pain is often complained of in the lumbar region. Pain in the iliac region may indicate the presence of a stone in the lower ureter, but is quite often present with a stone in the pelvis of the kidney. When the lesion is near the vesical end of the ureter (e.g. a calculus) frequency of micturition is often complained of, but this symptom may be entirely absent under these circumstances, and be present when a calculus is lodged in the renal pelvis. Pain of renal origin must be looked upon in many cases as referred pain, and its distribution as not necessarily giving any clue to the location of the lesion in the urinary tract.

Methods of Investigation.—Abdominal examination may discover displacements, deformities or enlargements of the kidney, swellings in the renal region, tenderness, rigidity, or areas of hyperaesthesia. Rectal and vaginal examination may detect a calculus in the lower end of the ureter, thickening of the latter, undue tenderness or other abnormality. Examination of the spermatic cord may disclose the presence of a varicocele, suggesting renal tumour if on the right side. The urine will, of course, be carefully investigated by chemical, microscopical and bacteriological tests. The absence of any demonstrable departure from the normal, however, does not by any means exclude the kidney. A small aseptic stone may be present without giving rise to any abnormal constituent such as blood, pus, or albumin. In certain cases of hydronephrosis the urine may be normal to the usual tests, and in pyonephrosis the affected ureter may be blocked at the time of examination. A tumour of the kidney may be present without showing any abnormality of the urine. X-ray examination, if thorough and efficient, will demonstrate alterations in the position, shape and size of the kidney, besides showing the presence of opacities. Cystoscopy may demonstrate alterations in the shape, size and surroundings of the ureteral orifice, and changes in the rate, rhythm and character of the efflux. Ureteral catheterisation will show the character of the urine from each side, and any alteration of the relative specific gravities. The latter test, which I will call the specific gravity test, has been of great service to me for diagnostic purposes. Shortly stated, I find that with unilateral disorders of the kidney the specific gravity on the affected side is diminished in a large proportion of cases. If there is a difference in specific gravity on the two sides, even if no other sign is present, the chances are that the kidney which secretes the urine of lower specific gravity is pathological. A low specific gravity does not necessarily mean a seriously damaged kidney. It may be due to reflex diuresis from a small fragment of stone or from early disease. On removal of the cause (if removable) the specific gravity returns rapidly to normal.

Combined with ureteral catheterisation, the subcutaneous, intramuscular or intravenous injection of dyes such as indigo carmine or phenol sulphone phthalein may give valuable information. The time of the appearance of these dyes in the urine, the amount present in the specimens collected by ureteral catheter, and the time taken for their elimination will assist in clearing up many doubtful cases. The ureteral catheter will further demonstrate patency or narrowing of the ureter, and, by injection of fluid, the capacity of the renal pelvis. By the opaque catheter or bougie, opacities discovered by radiography may be accurately located, and, if stereoscopic radiograms are employed, their position relative to the ureter and kidney accurately defined.

Finally, by pyelography the shape and size of the pelvis and calices, the presence and relations of foreign bodies, and the position, direction and calibre of the ureter may be demonstrated with the greatest accuracy. I now use almost exclusively bromide of sodium solution for this purpose. This is run in through the ureteral catheter into the pelvis of the kidney until the patient complains of slight discomfort. A radiogram is then taken which shows with great accuracy the shadow of the pelvis and ureter.

Should these methods fail to establish a diagnosis, or for any reason be unavailable, and the surgeon be in doubt between a renal and an abdominal lesion, it may be necessary to explore. For this purpose I have in a few cases employed an oblique abdominal incision extending from the mid-axillary line just below the costal margin to the iliac region parallel to the fibres of the external oblique. The anterior part of the incision opens the peritoneal cavity, and the posterior part allows of the retroperitoneal exploration of the kidney and ureter. In this way the appendix, caecum, colon, liver, gall-bladder, spleen, stomach, duodenum, tubes, ovaries, and uterus, as well as the kidney, may be explored with relatively little trauma to the abdominal wall. The possibility of disease of the spinal column or cord should always be borne in mind. Spinal caries, aneurysm of the aorta involving the vertebrae, tumours involving the spinal column or cord, and locomotor ataxia may give rise to pain closely simulating renal colic.

It now remains to mention some types of renal disorder commonly met with in practice which are attended with pain. Pain due to accompanying bladder conditions will not be discussed.

Renal Calculus.—Undoubtedly the most frequent cause of renal pain and renal colic in its worst form is renal calculus. Looking over the notes of seventy-two consecutive cases I find that pain was present at some time or another in all but two. The pain was of the most varied character. In one it was very indefinite on the affected, and also was present on the sound side. A large phosphatic stone weighing one and one-half ounces was removed from the pelvis of the right kidney. In another the pain was so slight that the patient, a young woman, was treated for fifteen years for Bright's disease. This was "cured" by the removal of an oxalate of calcium stone from the pelvis of a movable right kidney. On the other hand, a patient with a small phosphatic stone the size of a pea lodged in the pelvis of the left kidney, complained of "frightful" pain radiating to the groin and knee, associated with vomiting and rigors. The patient actually "yelled" with the pain in the knee. The radiation of the pain in these calculus cases varied greatly. Most usually it radiated towards the groin, testis, or labia majora, frequently over the buttock, or down the inner or outer side of the thigh, sometimes into the penis, sometimes down the leg as far as the heel or toes, and occasionally all over the abdomen. In one case it started in the left renal region, radiated right up the back to the shoulder and back of the head. The patient was relieved by the passage of a small stone. A patient in whom a small stone about the size of a melon seed was removed from the right ureter near the bladder. behaved like a regular madman during attacks of pain which, starting in the kidney, radiated to the testis. Another patient complained of cramplike pain in the lower abdomen, and passed some small, irregular calculi about the size of split peas. Another felt "something snap in the kidney." A calculus was subsequently removed from the renal pelvis on the affected side. In a patient with calculi in both kidneys the pain was now on one side and now on the other, and radiated on both sides into the leg. The following rather rare case is worth recording. The patient, a woman, suffered severe renal colic from the passage of a gummy material containing the characteristic spherules of calcium carbonate. The pain first affected the left side and radiated into the leg. There was rigidity and tenderness in the left loin. The urine contained a copious deposit of white material, thought to be pus,but which proved on microscopical examination to be an almost pure deposit of calcium carbonate. X-ray examination was negative. A few days later the patient took a severe pain in the opposite kidney, again with the discharge of calcium carbonate. Reduction of the calcium content in the diet effected a speedy cure.

Similarly one sees occasionally cases of renal pain due to the passage of crystals of oxalate of calcium, and probably other insoluble salts in the urine may cause pain.

In many of these cases of renal calculus frequency of micturition, especially during the attacks of pain, was complained of. This was apart from any associated cystitis or other bladder affection. Reflex vomiting, pallor and cold sweats were exceedingly common in the severe attacks.

Tuberculous Kidney.—It must be emphasized that renal pain is not a cardinal symptom of tuberculous kidney. Looking over the notes of 117 consecutive cases I find that pain was complained of in fifty-six cases only, that is, in less than half the number. Even in advanced cases pain may be entirely absent. In most of the painless cases there was thickening of the ureter, and, in many, very extensive destruction of the kidney substance. In one case, though the pelvis was enormously dilated and the ureter resembled a piece of small intestine, pain was not complained of. Even with a large perirenal abscess pain may be absent. In the painful cases the symptoms resembled those occurring in renal calculus but were rarely so severe. It was described as an ache, or a soreness more or less constantly present, or a feeling of fulness on the affected side. Attacks of renal colic were, however, not uncommonly met with, but these rarely attained the intensity of those due to calculus. A few patients stated that the pain started in the bladder and radiated up into the kidney on the affected side. Some complained of "soreness" in both kidneys, and in a few the pain was on the side opposite to the seat of disease. Radiation of the pain was somewhat similar to that found in calculus. In one case the pain radiated to the shoulder on the affected side. Vomiting and pallor with sweats were less frequent than in the case of stone.

The pain in tuberculous kidney is probably due to intra-pelvic pressure, but the chronicity of the disease allows of more gradual distension than in the case of stone. At times, however, the passage of thick pus or debris down the ureter may suddenly increase the pressure in the pelvis and give rise to colic. The thickened, rigid ureter, so frequently present, is hardly capable of spasm.

Pyelitis.—Pain is a very frequent symptom in pyelitis. Thus out of seventy-five cases which I have noted pain was present in fifty-nine or almost eighty per cent. In the acute cases with rigors and fever, vomiting, pain and tenderness, with, perhaps, palpable swelling of the affected organ, and muscular rigidity were commonly present. The pain was more fixed and constant than in calculus and tuberculosis and was not generally so severe as in calculus. Even in acute cases, however, pain may be entirely absent. In chronic cases pain is often absent, and the affected kidney is only discovered by cystoscopy or ureteral catheterisation. In one case in which inspissated pus was squeezed out from the ureter, no pain was complained of. In a few cases renal colic was present, the pain radiating to the groin, testis, or even to the leg or foot, but the type was generally much less severe than that seen in calculus. The following case in which the kidney was explored, is a good example of acute unilateral pyelitis. A married woman, aged thirty-two, had repeated rigors, with fever, sweating, rigidity and acute pain in the right lumbar region. The right kidney was tender and painful. Bacillus coli communis was found in the urine. On exploration the kidney was congested and enlarged and the pelvis was dilated. The local pain and tenderness in these cases are probably due to swelling of the parenchyma of the kidney and distension of its capsule. When colic is present it is no doubt due to the passage of purulent coagula along the ureter.

Hydronephrosis and Pyonephrosis.—In hydronephrosis we have the conditions most favourable to the development of renal colic, *viz.*, obstruction and distension of the renal pelvis. As might be expected, therefore, pain is a frequent symptom in these affections. Out of thirty-seven cases examined, pain was present in thirty-one, and doubtful in two. The pain, like that due to calculus and tuberculosis, varied very much in character and distribution. A very frequent history was that of pain, and a tumour in the side associated, perhaps, with vomiting. It is noteworthy that the radiation of the pain resembled very closely that seen in renal calculus. Now, in a large proportion of the cases the block was present at the uretero-pelvic junction and did not involve the ureter itself, yet the pain was very similar to that said to be due to the passage of a calculus along the ureter, and attributed to spasm of the latter. Some of the cases of hydronephrosis were associated with an abnormal renal artery running to the lower pole and crossing the ureter. Hurry Fenwick attributed the pain in these cases to spasm produced by the artery acting as a bowstring to the ureter. This spasm might itself cause pain or, by narrowing the ureter, produce intrapelvic pressure which, as we have tried to show, is the main cause of renal colic. A curious circumstance is that in some of these cases of hydronephrosis the pain is of recent onset though the state of the kidney found at operation justifies the assumption that the condition has been present for years. The patient may have been perfectly free from pain from his youth until suddenly he is seized with violent colic. Operation reveals a kidney reduced to a shell. Why then has pain not been present before? An explanation that suggests itself is that while very gradual distension spread over perhaps a number of years may be painless, a time comes when the uretero-pelvic junction becomes sufficiently kinked from the disturbed relations of the parts, caused by dilation of the pelvis, to cause a more or less complete block. Pain is then felt and is only relieved by the release of fluid from the dilated pelvis. In some cases hydronephrosis or pyonephrosis is accidentally discovered by palpation of the abdomen and in others again there is a history of attacks of pain extending over twenty years or more.

The pain in certain cases of hydronephrosis and pyonephrosis may rival in severity that found in renal calculus, as in the following: A man, previously healthy, began, at the age of twenty-three, to suffer from paroxysms of renal colic. Before admission to hospital he had had three attacks at five months intervals. The pain started in the left lumbar region and radiated towards the iliac fossa. During the attacks the patient became weak and vomited. The urine was clear amber, acid, sp. gr. 1020, free from albumin, blood, pus and micro-organisms. There was some tenderness in the left lumbar region but the kidney could not be palpated. X-ray examination was negative. Here we have a patient with typical attacks of severe renal colic with no definite physical signs, and with normal urine, a state of affairs occasionally seen and practically always attributed to stone. Cystoscopic examination showed no change in the bladder or ureteral orifices. Catheters were introduced into each ureter, but no flow could be obtained on the affected side until the catheter had been passed as far as the renal pelvis. Then a large quantity of fluid was obtained. The specific gravity of this specimen was 1005 as against 1025 on the sound side. Sodium bromide solution, a large quantity of which was accommodated without pain, was run into the renal pelvis on the affected side. Radiography demonstrated great dilatation of pelvis and calices, and operation revealed a large hydronephrosis.

Renal Tumours.—Pain may be entirely absent in cases of renal tumour. It was present in eleven out of eighteen cases recently examined, *i.e.*, in about sixty per cent. It was described as a soreness, a dragging pain, pain and tenderness, or severe renal colic. In one case the patient had what was described as "terrible" pain radiating down the leg and accompanied by vomiting and the passage of clots. In another case in which there was no visible blood in the urine, the patient complained of pain radiating to the outer side of the ankle. The tumour proved to be a malignant adenoma.

There are various factors which may contribute to the production of symptoms in renal tumours. The tumour may drag on, or involve, adjacent structures: by distension of the renal capsule it may cause pain; the pelvis may be partially or wholly filled with growth; the veins may be blocked with it; blood clot may be present and give rise to acute renal colic during its passage down the ureter, or detached portions of growth may act in the same way. Most of my cases who had pain suffered from renal colic of various degrees of intensity, and in most of them the cause appeared to be blood clot in the pelvis or ureter.

Haematuria.—In some cases of haematuria the blood is poured out in such small quantity that time is allowed for intimate admixture with the urine, and pain may be absent. In others the bleeding is so profuse that clotting does not take place until the blood reaches the bladder. In others again clotting takes place in the pelvis or ureter, and produces the wellknown symptoms of renal colic. After the passage of the ureteral catheter, when blood is drawn, it is not uncommon for acute pain to occur. No doubt in such cases the mucous membrane of the ureter is rendered more irritable by the trauma inflicted. Sometimes this pain closely simulates that produced by renal calculus. The amount of blood drawn does not seem sufficient of itself to account for it. That idiosyncracy plays a part is shown by the fact that in some patients the smallest clot may produce very severe symptoms while in others no discomfort is felt. This holds good in all forms of renal disorder in which pain is a common symptom.

Movable Kidney.—Pain is often present in cases of movable kidney, but this condition is so commonly associated with other manifestations of visceroptosis that it is difficult sometimes to apportion the blame between the various organs concerned. On the right side especially it may be impossible to differentiate symptoms of appendicitis, mobile caecum, and other abdominal affections from those due to displacements of the kidney, and mistakes in diagnosis are often made. In such cases I have found ureteral catheterisation and pyelography useful. Most usually, if any difference is seen in the specimens from the two sides it is a diminished specific gravity on the affected side, due, no doubt, to a reflex unilateral diuresis. Rarely, the specific gravity is raised on the affected side, due, perhaps, to delay and increased absorption of fluid from slight kinking of the ureter. Pyelography may show some alteration in the pelvis or change in the calibre or direction of the ureter. The following case is a good illustration. A man, aged twenty-seven, previously healthy, took a sudden severe pain in the left lumbar region, radiating to the groin and testicle. He also felt sick and vomited, and complained of a constant desire to micturate, passing only a few drops at a time. He had several similar attacks. The urine was free from albumin and pus but contained a few red blood cells. The specific gravity of the specimen on the affected side was 1005 as against 1015 on the sound side. Pyelography showed a sigmoid bend on the ureter just below the renal pelvis on the affected side. No calculus was seen but the kidney was tilted and lower in position than normal. Nephropexy straightened out the ureter, fixed the kidney in its normal position and cured the patient.

Other Causes of Renal Pain.—One must always bear in mind that renal pain may be due to some condition of bladder or urethra. Carcinoma of the bladder, a papilloma at a ureteral orifice, an enlarged prostate or stricture of the urethra may cause renal pain on one or both sides from back pressure. Besides these there are some rarer conditions occasionally met with which are accompanied with renal or pyelic pain. Such are certain forms of chronic nephritis, infarcts, hydatid cyst in which small cysts are sometimes passed, giving rise to attacks of renal colic, other cysts of the kidney, and horseshoe kidney.

As a confession of failure, due no doubt to faulty methods in the past, I am bound to admit that I have only too frequently seen cases of renal colic in which I have been unable to trace the cause.

In some of these the urine has been perfectly normal, and x-ray examination negative. In a certain number the only indication of a renal origin has been a diminished specific gravity on the affected side. This may have been due to a small undetected calculus, a narrowing or kinking of the ureter, an accessory renal artery, or some other obscure condition which reflexly alters the blood supply of the organ. In other cases every method of diagnosis has been tried, with the sole result of excluding gross lesions.

Recent advances in our methods of examination will reduce the number of undiagnosed cases and add to the satisfaction of all concerned in the investigation and treatment of these elusive complaints.

Treatment.—Cases of renal pain will be dealt with, of course, by removal of the cause, when this is possible. Papin and Ambard* point out, however, that in certain cases of painful nephritis, small hydronephroses and renal neuralgias of ill-defined character the only treatment which up to the present has been applied has been either insufficient or excessive. While decapsulation, temporary nephrotomy, and nephropexy are insufficient to effect a cure in a large proportion of cases of this sort, removal of the kidney is too drastic a step. Under these circumstances they have devised an operation which relieves the pain and yet conserves the kidney. This consists in resection of the nerves of the kidney. The pedicle is carefully exposed, the nerve filaments accompanying the vessels are defined, seized one by one with dissecting forceps and torn across by slipping under each a probe-pointed director. The authors state that it is not difficult to distinguish the resistant nerves from the softer lymphatics. Before the operation can be considered complete the vessels should have been stripped of all the nerve filaments surrounding them. In order to expose certain of the fibres it is necessary to pass between the different branches of the vessels. The renal vein is in danger of being torn unless care is taken. Should this accident happen, a delicate suture should be used to close the opening. In all cases the kidney is fixed in position by flaps of capsule, and a small drain is placed at the lower end of the wound. The authors publish detailed accounts of six cases so treated, with complete relief in five. After this operation the patient suffers much more than after any ordinary operation on the kidney, even nephrectomy. There is, however, no urinary trouble, neither polyuria nor marked oliguria. Things are just as they are after any operation outside the urinary tract. In these patients, specimens of urine taken from the enervated kidney differed little from those collected from its fellow of the opposite side.

In conclusion, it is apparent that the idea running through this address is that the pain we have been discussing is due in a large proportion of cases to distension of the renal pelvis.

Treatment should be directed towards removing the cause, and involves, in some instances, ablation of the kidney. In selected cases it may be possible to relieve the patient by interrupting the nerves carrying the painful impressions.

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*Loc. cit.

A STUDY OF ONE HUNDRED CASES OF CHOREA WITH PARTICULAR REFERENCES TO THE CARDIAC COMPLICATIONS*

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THE purpose of this study is to review a series of cases of chorea with the idea of determining the incidence of cardiac disease in uncomplicated cases and to see what influence the added occurrence of rheumatic fever and other factors may have on the frequency of cardiac involvement. For this one hundred consecutive cases of typical chorea were selected. These patients were treated on the wards of the Peter Bent Brigham Hospital during the years 1913-1921, inclusive. In every case special inquiry had been made into the personal history with regard to the occurrence of acute rheumatic fever. On discharge every patient was carefully examined to determine just what damage had been done to the heart. A diagnosis of organic cardiac disease was only made after a thorough consideration of all the factors. It is safe to assume therefore, that the diagnosis in these cases represents a fairly accurate approximation of the incidence of cardiac disease. It is recognised, of course, that in certain patients further evidence of cardiac damage may develop in the future. This applies particularly to the development of mitral stenosis, for I am of the opinion that mitral stenosis can develop insidiously without any further acute infection, while the signs of aortic insufficiency usually appear during or immediately after the acute process.

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General Etiological Considerations

This group of cases conformed as to sex and age with the generally accepted notions in this regard. There were sixty-six females and thirty-four males, a ratio of two to one. The average age was 13.3 years, the oldest patient being twenty-three and the youngest four years old. The predominance of females is striking when compared with a series of 190 cases of acute rheumatic fever that was similarly studied, in which the ratio of females to males was nearly one to two, *i.e.*, just the opposite to the proportion in chorea. If both chorea and acute rheumatic fever are evidences of a "rheumatic" infection why should girls be attacked by chorea so much more frequently than boys? It may be due to the fact that this "rheumatic infection" is apt to attack the most vulnerable part and that in a general way the most vulnerable part in boys is the joints and muscles, while in girls, particularly at this adolescent period, it is the nervous system.

In considering the etiology of chorea which is by no means settled, there are various factors that are of especial interest when compared with the findings of this study. The relation of heredity to chorea is slight. In this review there was a history of chorea in the immediate family in nine per cent. of the cases. This would seem to indicate not an actual transmission of chorea but the transmission from parents to children of a nervous system of increased vulnerability, or the transmission of an increased susceptibility to rheumatic infection. Poynton[1] says that the "undoubted hereditary tendency of rheumatism makes itself felt in the family history of chorea." There was a history of insanity in the father or mother in five per cent. of these patients. This fact may have some bearing on the importance of a weakened nervous system. It is furthermore impossible to judge what rôle the infectiousness of this disease has in attacking more than one member of the same family. Are they more exposed to the same bacterial cause?

Rheumatism has for some time been considered an important factor in the causation of chorea. Russell[2] in 1910 said, "there is abundant evidence that both diseases are microbic in origin and that the same micro-organism is responsible for the clinical manifestations of rheumatism and chorea." It is generally agreed that a certain number of cases of chorea have had acute rheumatic fever. This percentage varies considerably throughout the literature ranging from less than two per cent. to over eighty-five per cent. The wide variation is chiefly due to a difference in definition of the term "rheumatism." Koplik[3] says that rheumatism should include beside acute rheumatic fever, the common joint pains and growing pains which he regards in children as definitely rheumatic in origin. Other authors limit the term to clearly defined cases of acute rheumatic fever. As Mackintosh and Anderson[4] point out, if only the definitely diagnosed cases are included the percentage is too low and if all cases with a history of muscle or joint pains are included the percentage is too high. Thayer[5] in 789 cases found rheumatism in the past history in 21.6%. Osler[6] in a series of 554 patients found a history of acute rheumatic fever in eighty-eight or 15.8%. In an additional thirty-three cases there was a history of acute rheumatic pains. This brings the total to nearly twenty-two per cent. The Collective Investigation Committee[7] of the British Medical Association, in reporting a series of 439 patients with chorea, found 116 which gave a definite history of joint affection with fever, and twenty-six doubtful cases making a total of 142 patients or 32.5%. St. Lawrence[8] in an intensive study of sixty-five children under observation for an average period of four and one-half years, found forty-one cases of chorea, nine or 21.9% of which had acute rheumatic fever. In most instances where only the definitely diagnosed cases of acute rheumatic fever are included the percentage is surprisingly close to twenty per cent. In this series there was a history of definite acute rheumatic fever in twenty per cent. of the cases. In addition there were fourteen patients who gave a history of joint pains. This brings the total possible cases of preceding rheumatism up to thirty-four per cent. As a matter of fact probably both chorea and acute rheumatic fever are signs of the same infection, so that it is quite incorrect to speak of one as the cause of the other.

Other diseases that may be mentioned in relation to the cause of chorea are scarlet fever, tonsillitis and syphilis. Scarlet fever is claimed by some to be an important cause of chorea. If scarlet fever is regarded as another type of rheumatic fever, it may have the same relation to chorea that acute rheumatic fever has. Scarlet fever occurred in the past history in eighteen per cent. of these cases, but in only one instance did the attack of scarlet fever seem to bear any relation to the chorea. In this case the scarlet fever developed while the patient was under treatment for chorea. Tonsillitis, which also may be regarded as an evidence of "rheumatic" infection, and which is variously regarded by different writers in its relation to chorea, occurred in thirty-four per cent. of these cases. Many cases of tonsillitis particularly in children, are overlooked so that this factor may be more important than is generally believed. Milian[9] of Paris, found evidence of syphilis in seventy-five per cent. of his patients. This finding is not supported by more recent investigations. A positive blood Wassermann has been found in from four to seventeen per cent. of cases variously reported. Serological examination of the spinal fluid has been negative in all of a number of reported instances. In this series there was a positive blood Wassermann in 11.6% of the patients. As this is about the usual finding of positive Wassermann tests in our hospital cases[10] it seems unlikely that syphilis plays any rôle at all in the causation of chorea.

It is interesting to note that in four cases in this series there was an absolutely negative past history; *i.e.*, four children had been perfectly well before the attack of chorea. Two of these cases developed organic cardiac disease. In neither of these patients was there any joint or muscle pains either in the history or during the course of the chorea. Whereas there are many cases in which the cardiac damage was in my opinion due to the chorea, in these two patients with a history of no other infectious diseases we can feel sure that the chorea alone was responsible for the cardiac involvement. Some observers still question the part played by chorea in the production of heart disease. One difficulty in answering their contention has been in finding cases like these mentioned above in which chorea could be shown to be the only possible cause of the endocarditis. Fright or any strong emotion may act as the exciting cause of an attack of chorea. In this series there were eighteen cases in which the onset of the disease dated from some sudden fright. It is interesting that the report of the Collective Investigation Committee of the British Medical Association[7] gives twenty per cent. as the number of cases in which fright seemed to play a part. Fright is never the sole cause. Poynton[1] mentions the fact that there was no appreciable increase in the incidence of chorea in London during the air raids, when if fright alone were ever the cause it surely had every opportunity and should have been expected to operate.

Cardiac Complications.—The incidence of cardiac disease following chorea varies in the different series reported. This variation is due to several factors. Some authors have included only those cases in which the endocarditis developed during or immediately following the first attack of chorea, others have included cases who have had repeated attacks of chorea and rheumatic fever, while still others have reported cases examined from two to four and one-half years after the chorea. The accompanying table summarizes their reports.

Table I

Author	*Total number of cases*	*Percentage that developed cardiac disease*
Koplik (3)	319	72
Fraser (11)	300	63
Osler (6)	140	51
St. Lawrence	41	39
Abt & Levinson (12)	226	37
Branson (13)	67	33
Collective Investigation Com. (7)	439	31.4
Helmholtz (14)	138	26
Thayer (5)	689	25.4

From this table we see that in a total of 2,359 cases of chorea there was organic cardiac disease in 953 or 40.3%. This means that two-fifths of all cases with chorea will have organic heart disease. In our series of 100 cases there were forty-five instances with organic cardiac disease. It is interesting to compare in this connection the findings in the series of 190 cases of acute rheumatic fever previously mentioned, in which there was organic heart disease in only 38.1% of all cases. This emphasizes again what Osler said in 1892 in a discussion on chorea at the meeting of the American Pediatric Society "there is no other disease in which endocarditis is known to be so frequently associated and no other disease in which post-mortem records show such a large proportion of endocarditis."

The type of cardiac disease produced was in every case an involvement of the valves; in a few cases there was further cardiac damage, such as pericarditis or actual myocarditis. The signs of involvement of the whole heart, pancarditis, did not occur as frequently in this series as in the group of 190 cases of acute rheumatic fever. There was only one case of pericarditis in this series while in the acute rheumatic fever patients there were thirteen such instances or 6.8%. Myocardial involvement as determined by conduction defects occurring during the acute illness was not as common during chorea as in acute rheumatic fever. In the chorea series partial or complete heart block occurred in only one case or 2.2% of those patients in whom electrocardiograms were taken. In the acute rheumatic fever patients on the other hand, heart block occurred during the hospital stay in fifteen per cent. of the cases so studied. It seems from the above findings that although the incidence of cardiac involvement in chorea is greater than in acute rheumatic fever the extent of the cardiac damage is less.

Effect of Recurrences.—Recurrences are common in chorea and naturally with repeated attacks of chorea the incidence of heart disease increases. In this connection it must be remembered that there are many undiagnosed cases of chorea. Just as rheumatic fever may be represented by mild transitory pains in the joints or muscles so chorea may consist merely in a spell of nervousness, irritability or fidgets. These undiagnosed cases undoubtedly falsify to some degree the statistical incidence of heart disease. This is particularly true in those cases in which a mitral stenosis is found with no history of acute rheumatic fever. Undoubtedly this valvular lesion is the late result in some cases of an undiagnosed chorea. Thayer's[5] figures in regard to recurrences are interesting.

	Single Attack	*Two Attacks*	*Three or More Attacks*
Number of cases of chorea........	499	163	137
Number of Cardiac Lesions.......	85	42	43
Percentage of Cardiac Lesions....	17%	25.7%	31.3%

In twenty-nine per cent of the patients in this study there had been recurrences of chorea. The incidence of cardiac disease was higher in these twenty-nine cases than in the group as a whole or in the cases without previous chorea. In the whole group, forty-five per cent. of patients had cardiac disease, in the twenty-nine cases with previous chorea fifteen or 51.7 per cent. had heart disease, and in the seventy-one cases with only one attack of chorea thirty or 42.2 per cent. had a diagnosis of organic cardiac disease on their discharge from the hospital.

Effect of Other Infections.—The incidence of cardiac disease was much increased in those cases who had had acute rheumatic fever. Of twenty such cases, fourteen or seventy per cent. had heart disease, while of the remaining eighty cases only thirty-one or 38.7 per cent. had cardiac involvement. Thayer[5] in a much larger series of cases found much the same thing. The converse of this is also true in the series of acute rheumatic fever cases, the incidence of cardiac disease was greater in those who had had chorea. Certainly the occurrence of acute rheumatic fever and chorea in the same patient renders the likelihood of cardiac disease very great.

The occurrence of tonsillitis did not seem to increase the incidence of cardiac disease. Of thirty-four cases with a history of tonsillitis or sore throat, fifteen or 44.1 per cent. had organic cardiac disease.

The Influence of Fever.—The temperature during the attack of chorea may or may not be elevated. Many cases are afebrile throughout; others show slight elevation of temperature, and in some few patients a hyperpyrexia occurs. The latter group was studied to determine the incidence of organic heart disease in the febrile, as compared with the afebrile cases. Since this series is made up almost entirely of children and young adults minor elevations of temperature were disregarded as of too common occurrence at this age to indicate a febrile reaction. The cases were divided therefore into those with temperatures of 99° or less and those with temperatures over 99°. Of the forty cases with temperatures over 99°, twenty-two or fifty-five per cent. had organic disease. Only 38.3 per cent. of the sixty cases with temperatures of 99° or less had such a diagnosis. The occurrence of an elevation of temperature during an attack of chorea would seem therefore to increase slightly the likelihood of cardiac involvement. It is to be remembered of course that endocarditis may occur during chorea without any elevation of temperature. Of the forty-five patients in this whole series who developed organic heart disease only twenty-two had temperatures over 99°. This whole question is of particular interest when considered in relation to the idea that chorea in some cases may be a functional neurosis.

Such afebrile cases have been cited as evidence that chorea is a functional condition. In a functional disease of the nervous system, however, one would not expect such a large incidence of a type of organic cardiac disease that has the appearance of infection. I believe that the clinical picture of the disease that we know as chorea is due to an infection which involves the central nervous system and often the heart.

Valvular Involvement.—In the forty-five cases of organic cardiac disease the mitral valve was involved in forty-four and the aortic valve in only five cases. In the series of 190 cases of rheumatic fever there were seventy-two instances of heart involvement and of these fifty-six had mitral and thirty had aortic disease. When these two groups are compared the greater frequency of aortic involvement in the rheumatic and of mitral involvement in the chorea group becomes apparent. This is another difference between chorea and rheumatic fever that must be explained if these two diseases are to be regarded as being caused by the same infection. The more frequent involvement of the aortic valve in acute rheumatic fever may be explained in part by the fact that in acute rheumatic fever males are much more commonly attacked than females and it is true that all types of aortic disease more often affects males than females. This is not the entire explanation, however, as in the thirty-four males among the chorea cases the aortic valve was involved in only two cases, or six per cent., whereas in the 119 males in the acute rheumatic fever series the aortic valve was involved in twenty-six cases or twenty-two per cent. The type of rheumatic infection responsible for chorea seems to have a special predilection for the mitral valve.

Heart Irregularities.—The electrocardiographic examination of the heart in these cases showed a much lower incidence of the signs of myocardial involvement than appeared in the group of acute rheumatic fever patients. As mentioned before in this series there was evidence of impaired conduction in only 2.2 per cent. of patients, as compared with fifteen per cent. in the rheumatic fever cases. It is interesting to note that the one chorea case that showed delayed conduction died about five days after this sign appeared.

Permanent heart block of any grade is usually regarded as a serious and progressive disease. There was one patient included in the series of acute rheumatic fever cases that is of interest in this regard. This man had acute rheumatic fever in the Peter Bent Brigham Hospital in 1915. During his illness he developed an aortic regurgitation and electrocardiographic evidence of delayed conduction. He made a good recovery and at the time of his discharge from the hospital his auricular-ventricular conduction time was .32 seconds. He was cautioned to limit his activities as much as possible. Following his discharge he felt perfectly well and has since been working very actively as a city salesman. On re-examination in May, 1922, seven years after his attack of acute rheumatic fever, he shows the typical signs of an aortic insufficiency and his electrocardiogram discloses a P-R interval of .32 seconds. In every other regard he is absolutely fit and has never had any symptoms of myocardial insufficiency. Apparently what ever damage was done to his conducting apparatus has not been progressive.

Although chorea and acute rheumatic fever are probably evidence of the same infection, involving different systems, the effect on the heart is somewhat different for the two diseases. The incidence of cardiac involvement is greater in chorea but the extent of the damage to the heart muscle seems less than in acute rheumatic fever. In the latter there is a much more frequent occurrence of such evidences of generalized heart damage as heart block, auricular fibrillation and pericarditis. Chorea attacks females twice as often as males while rheumatic fever affects males twice as often as females. Possibly the susceptibility of the nervous system of the one and the articular system of the other explains this discrepancy. The greater incidence of mitral disease in chorea and comparatively greater occurrence of aortic disease in rheumatic fever may be partly explained by this sex discrepancy for in males the aortic valve is much more often involved than in females no matter what the causative agent may be. That this is not the entire explanation is evident from the fact that even among males chorea affects the aortic valve much less commonly than rheumatic fever.

Summary.—One hundred cases of chorea and one hundred and ninety cases of acute rheumatic fever were analyzed, from which the following deductions were made.

1. Twenty per cent. of the chorea patients gave a history of previous acute rheumatic fever.
2. The incidence of organic heart disease in chorea was forty-five per cent., while that in rheumatic fever was thirty-eght per cent.
3. Recurrences of chorea increased the likelihood of cardiac involvement.

4. When chorea and acute rheumatic fever had occurred in the same individual the incidence of cardiac complication was greatest, *i.e.*, seventy per cent.

5. Tonsillitis did not seem to affect the occurrence of organic heart disease following chorea.

6. Fever during the chorea slightly increased the likelihood of cardiac damage, although it seemed that endocarditis could develop in a patient with an afebrile course.

7. The aortic valve was much more rarely involved in chorea than in the rheumatic group, while the mitral valve was much more commonly affected.

8. Evidences of generalized heart damage such as pericarditis, conduction defects, or auricular fibrillation were much less common in chorea than in acute rheumatic fever.

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OBSERVATIONS ON TETANY*

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During the past year the writer has had the opportunity of studying four adult patients with tetany. A summary of the clinical history is given here. My chief interest has, however, been in an investigation of the concentration of some of the inorganic components of the blood in these cases. The results of these determinations are presented in the present paper and their significance discussed. Three of these patients suffered from "gastric tetany," the result of pyloric obstruction. In the fourth patient tetany followed the intravenous administration of sodium bicarbonate during an attack of acute nephritis.

Summaries of the Cases

A.—*Patients with "gastric tetany."*

(1) J. W., Age 28.—Male.—Admitted March 3rd, 1921—"Stomach trouble" for past year. Examination on admission suggested pyloric obstruction. Vomiting a prominent symptom. On March 6th complained of tingling, numbness and cramps in extremities. On March 7th, while having stomach washed out, he complained of cramps in arms and feet. Five minutes later he went into a tetanic convulsion affecting muscles of face, extremities and abdomen. Conscious throughout. On March 8th patient still complained of cramps. Blood was taken for chemical examination and showed the following findings. Serum: sodium, 287 mgs. per 100 cc; chlorides, 3.55 gms. as sodium chloride per litre; calcium, 10.6 mgs. per 100 cc. Plasma: bicarbonate CO_2, 103 vols. per cent. Calcium lactate, gms. 4 to pint of water was administered by mouth as well as a solution of calcium lactate (gms. 4 to pint) in normal saline by rectal drip. On March 9th he was given a subcutaneous infusion of normal saline. There was no return of symptoms of tetany after March 8th. On March 10th the man was operated on, and a carcinomatous growth producing pyloric obstruction was found. The patient recovered from the operation and was discharged having had no return of his symptoms.

(2) G. S., Age 40.—Male.—Admitted January 28th, 1922—History of "stomach trouble" for past ten years. Ten days previous to admission symptoms became acute with frequent vomiting. On January 27th he took the train to Baltimore for the purpose of entering the hospital. Dur-

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ing the journey the patient became delirious and had convulsive movements of the arms and legs. On admission he was quite unconscious, greatly emaciated and desiccated. The neck was rigid. Respiration shallow and of Cheyne-Stokes type. He died a few hours after admission. A sample of blood was taken shortly before death and showed the following findings. Serum: sodium, 305 mgs. per 100 cc; calcium, 9.4 mgs. per 100 cc; phosphorus (inorganic), 7.2 mgs. per 100 cc. Plasma: bicarbonate CO_2, 130 vols. per cent.; chlorides 2.03 gms. as sodium chloride per litre. Corpuscles: chlorides, 1.10 gms. as sodium chloride per litre. A diagnosis of carcinoma of stomach at the pyloric end with gastric tetany was made. Autopsy showed gastric ulcer with perforation, complicated by subphrenic abscess.

(3) H. G.—Female.—Age 59.—Admitted March 22nd, 1922.—History of vomiting for past twelve years. This had been growing steadily worse for the past six to eight months. Marked loss of weight. A diagnosis of probable gastric carcinoma was made and on March 28th a laparotomy was done. No tumour found. Stomach much contracted. Gall-bladder packed with gall-stones. A cholecystectomy was done. Following the operation the nausea and vomiting persisted. The wound healed satisfactorily. On April 13th patient showed carpopedal spasm, and Trousseau's sign was elicited. Blood was taken for examination and showed the following findings. Serum: sodium, 305 mgs. per 100 c.c.; calcium, 8.8 mgs. per 100 cc; phosphorus, 2.8 mgs. per 100 cc; bicarbonate CO_2, 86.2 vols. per cent. Plasma: chlorides, 3.77 gms. as sodium chloride per litre. The patient up till this time had received rectal enemata of normal salt solution as well as food by mouth. She was now given 500 cc. of an isotonic neutral solution of ammonium chloride intravenously* and a subcutaneous infusion of 1,500 c.c. of normal saline. The symptoms of tetany disappeared shortly after. Forty-five minutes after the ammonium chloride injection, the bicarbonate CO_2 was 53 vols. per cent., and the chlorides 4.55 gms. as sodium chloride per litre. On the following days until April 20th subcutaneous infusions of saline were administered. There was no return of the symptoms of tetany but the vomiting continued. The patient died on April 26th. Autopsy showed a diaphragmatic hernia.

B.—*Patients with bichloride of mercury poisoning and acute nephritis.*

(4) A. C.—Female.—Age 35.—Admitted October 24th, 1921.—Pregnant for six weeks. On October 20th she inserted a tablet of bichloride of mercury into the vagina. Followed shortly by vomiting and cramps in legs. On October 22nd had a sore mouth. Complete anuria since that date. The vomiting continued. The patient on admission October 24th was very restless, showed a marked stomatitis and gingivitis. Severe vaginitis. Blood examination showed the following findings. Plasma: bicarbonate CO_2 32 vols. per cent.; chlorides 4.28 gms as sodium chloride per litre. At 3 p.m. an intravenous injection of 500 c.c. of 5 per cent. sodium bicarbonate was given. Two hours later patient showed carpo-pedal spasm and Trousseau's sign was present. At 7 p.m. venesection was performed and 750 c.c. of blood withdrawn. Blood examination at this time showed bicarbonate CO_2 54.6 vols per cent.; chlorides 3.71 gms. as sodium chloride per litre. A transfusion of 600 c.c. of citrated blood was given. On October 25th urine showed albumen and casts. Blood examination showed the following: serum: sodium 297 mgs. per 100 c.c.; calcium 5.4 mgs. per 100 c.c.; phosphorus (inorganic) 15 mgs. per 100 c.c.; bicarbonate CO_2 65 vols per cent.; chlorides 3.93 gms. per litre as sodium chloride. The patient became oedematous and vomiting more severe. Died on October 26th.

(5) *Patient without Tetany.*

A. F.—Female, age 20.—Admitted November 7th, 1921.—Had been suffering from pelvic inflammatory disease. On November 5th inserted a bichloride of mercury tablet into vagina in order to relieve pain. On morning of November 6th had marked swelling of perineum and intense burning. Since 3 p.m., November 6th, had anuria. On November 7th gums and tongue swollen, teeth loose. On admission to hospital showed oedema of face, marked stomatitis and gingivitis. Oedema of vulva. On November 9th urine showed albumen, but no blood or casts. Blood was taken for chemical examination. The non-protein nitrogen was 100 mgs. per 100 c.c. Serum: sodium, 286 mgs. per 100 cc.; calcium, 8.5 mgs. per 100 cc.; phosphorus (inorganic), 7.2 mgs. per 100 cc.; bicarbonate, CO_2 50 vols per cent.; chlorides, 4.47 gms. per litre as sodium chloride. On November 10th became stuporous and more oedematous. Died on November 11th. The diagnosis of bichloride of mercury poisoning with acute nephritis was made.

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*This patient was in the service of Dr. W. S. McCann who has reported the effect of ammonium chloride administration in the Proceedings of the Society for Experimental Biology and Medicine, Vol. 19, No. 8.

The following table shows the blood findings in these five cases, with normal values appended.

		Normal	*Gastric Tetany*			*Bichloride poisoning with acute Nephritis*	
			I	II	III	*Tetany*	*No Tetany*
Serum	Sodium mgs. per 100 cc.....	320-340	287	305	305	297	286
Serum and Plasma..	Chlorides as NaCl gms. per litre	56.0-6.00	3.55	2.03	3.77	3.93	4.47
Serum and Plasma..	CO_2 bound as bicarbonate. vols. per cent...........	55-73	103	130	86.2	65	50
Serum	Calcium mgs. per 100 cc. ...	9-10.5	10.6	9.4	8.8	5.4	8.5
Serum	Phosphorus (inorganic) mgs. per 100 cc	1.-3.5		7.2	2.8	15	7.2

I am indebted to Dr. W. S. McCann and Dr. F. F. Tisdall for permission to use their figures for several of the above determinations.

SUMMARY OF TABLE

In the patients with gastric tetany the sodium concentration of the serum was moderately but definitely reduced. A very striking reduction in the concentration of chlorine occurred in these cases. On the other hand the bicarbonate concentration was markedly increased. In contrast to what has been found in infantile tetany where the calcium of the serum is regularly diminished we found the concentration of this element essentially normal in these cases.

In the cases of acute nephritis following bichloride poisoning there was a diminution of both the chlorine and sodium concentration of serum. The bicarbonate concentration while essentially normal showed a higher figure in the patient with tetany. The concentration of calcium in the serum was reduced in both patients but reached a much lower level in the patient with tetany. The inorganic phosphorus concentration of the serum was increased in both patients, but the increase was more marked in the patient with tetany.

As far as we are aware, Hastings, Murray and Murray have been the only investigators who have reported a low sodium concentration in the serum in cases of "gastric tetany." They noted this in experimental tetany in two dogs following pyloric obstruction. Gamble and Ross (unpublished work) have confirmed these findings in experimental "gastric tetany" in dogs.

The reduction in the chlorine concentration of the serum in "gastric tetany" is a well recognized phenomenon. It has been noted by MacCallum[2] and by Hastings, Murray and Murray[1] in experimental "gastric tetany" in dogs It is without doubt due to the loss of the chlorine ion by way of the stomach. The low chlorine concentration of the serum in the patients with bichloride poisoning was in all probability due to the vomiting which accompanied this condition.

The increase in the bicarbonate CO_2 concentration in the serum in "gastric tetany" has been noted by MacCallum,[2] McCann[3] and by Hastings, Murray and Murray[1]. These writers were all working with dogs. This increase is probably due to the fact that the much greater reduction of chlorine than of base (as measured by sodium) in the serum uncovers base, which combines with carbonic acid the only available acid. The increase in bicarbonate results.

The normal values obtained for calcium in the serum of the patients with "gastric tetany" are of interest in view of the much discussed relationship of this element to tetany. MacCallum[2] and Hastings, Murray and Murray[1] noted the same findings. The calcium values obtained in the patients with bichloride poisoning are significant. The patient with tetany showed a low calcium value whereas the one who did not develop tetany had a nearly normal value. Marriott and Howland[4] have reported low calcium values in certain types of nephritis.

It is significant that the phosphorus (inorganic) concentration in the serum was definitely increased in both cases of bichloride poisoning. This phosphorus retention is probably a measure of diminished kidney function. The most marked increase was in the patient who developed tetany and showed the lower calcium concentration. This inverse relationship has been pointed out by Marriott and Howland[4] in certain types of nephritis.

Discussion

The occurrence of "gastric tetany" in human beings and its association with pyloric obstruction has long been recognized. It was produced experimentally in dogs by MacCallum[2] and his co-workers, by McCann[3] and by Hastings, Murray and Murray[1]. MacCallum mentioned the possibility of a true alkalosis being present in this condition. He thought it possible that the disturbed equilibrium of acids and bases in itself was the cause of the symptoms. McCann concluded that tetany was a condition of alkalosis in which a disproportion between the rates of secretion of acid and alkalies by the gastro-intestinal tract might be a factor. Hastings, Murray and Murray demonstrated a slight change in the pH of the blood toward the alkaline side. They did not, however, consider that there was any proof that alkalosis *per se* could cause tetany. They had no explanation to offer for its causation.

It has been recognized for several years that symptoms of tetany might follow the administration of large doses of sodium bicarbonate. This is more likely to occur when the kidney function is impaired as a result of nephritis. Howland and Marriott[5] have reported several of these cases. A case in almost all respects similar to my case following bichloride poisoning was reported by Harrop.[6] In his patient the bicarbonate CO_2 of the serum rose to 80 vols. per cent. following the intravenous administration of sodium bicarbonate. Tetany resulted. There was, however, no diminution in the calcium of the serum. He concluded that the condition was associated with, if not directly precipitated by, the suddenly increased alkalinity of the blood due to the sodium bicarbonate injection.

In infantile tetany it has been conclusively demonstrated by Howland and Marriott[5] that there is a marked reduction in the calcium concentration of the serum. They found no evidence of a change in the pH of the blood toward the alkaline side. I have examined the blood of a number of these patients and have found no increase in the bicarbonate of the serum. Kramer, Tisdall and Howland[8] found the sodium concentration of the serum normal in infantile tetany.

It must be recognized, therefore, that in these three types of tetany *viz:* gastric tetany, tetany following bicarbonate injections and infantile tetany we meet with a common symptom although the blood of the patients shows a totally different picture. In infantile tetany the calcium concentration of serum is invariably reduced; in gastric tetany it is normal, whereas in the tetany following bicarbonate administration it may be normal or reduced. In infantile tetany the bicarbonate of the blood is normal; in gastric tetany it is greatly increased; in the tetany following bicarbonate administration it is increased. In infantile tetany the chlorine content of the blood is normal, in gastric tetany it is greatly reduced and in the tetany following bicarbonate administration it may be reduced. In infantile tetany there is no evidence to suggest an alkalosis, in gastric tetany there may be a slight change in the pH of the blood toward the alkaline side. The phosphorus (inorganic) concentration of the serum is normal in infantile tetany. It may be increased in gastric tetany and also in the tetany following bicarbonate administration. The sodium concentration of the serum is normal in infantile tetany, in gastric tetany it is definitely reduced.

Is it possible to explain on a common basis these three types of tetany in which the blood findings are so diverse? We shall not discuss here the pathogenesis of another type of tetany *viz*, that following parathyroid insufficiency.

It was first observed by Ringer that solutions of calcium salts inhibited muscle twitchings caused by sodium chloride solution. From the work of numerous physiologists in recent years it is permissible to assume that neuro-muscular irritability is dependent upon the relationship between the sodium and calcium ions in the fluids bathing these tissues. A reduction of the $\frac{Ca}{Na}$ ratio in the body fluids would then be liable to produce tetanic contractions in voluntary striated muscle. If the concentration of these cations in the blood serum is a measure of their concentration in the extra-cellular body-fluids, we might be led to expect a reduction of this ratio in all types of tetany. This, however, is not the case. It must be remembered, however, that it is the calcium ion which in all probability represents the functionally active calcium. The present chemical methods serve to determine not the calcium ion concentration but the total calcium of the serum. This may be divided into three fractions: (1) the calcium in combination with protein, (2) the calcium which exists as ionized calcium, and lastly (3) a fraction which exists as the undissociated calcium salt. The relative proportion of these various fractions is still a matter of debate. It is conceivable, however, that the calcium ion concentration is directly proportional under constant conditions to the total calcium concentration so that when the latter is reduced the ionized may be correspondingly reduced. On the other hand, Rona and Takahashi[8] have shown that the calcium ion concentration of a solution depends not only upon the actual calcium concentration but also upon the bicarbonate ion concentration and upon the hydrogen-ion concentration.

This is expressed in the following equation: $\frac{(Ca^{\cdot\cdot})\ (H\,CO_3')}{(H^{\cdot})} = K.$ In other words where $Ca^{\cdot\cdot}$ represents ionized calcium, HCO_3' the bicarbonate ion, and $H^{\cdot}$ the hydrogen ion (or pH), any variation in one of these factors causes a change in one or both of the other factors of the equation. Thus the concentration of calcium ions would vary inversely with a variation in the bicarbonate ion, the hydrogen ion concentration remaining constant, and directly with the hydrogen ion concentration, the bicarbonate ion remaining constant. They found that a solution of calcium bicarbonate whose H-ion and bicarbonate concentration corresponded to that of the blood serum showed a concentration of dissolved calcium of slightly over 2 mgs. per 100 cc. It has, however, been shown that the calcium content of blood serum varies from 9-11 mgs. per 100 cc. By dialysis experiments on serum, however, these authors were able to show that all but a small percentage of the calcium in serum was in a freely diffusible form. The small indiffusible fraction they considered to be in the form of a calcium-protein compound. Therefore they concluded that the calcium bicarbonate of the serum must be present in a supersaturated solution, due to conditions more favourable to solution in serum than in pure salt solutions. Michaelis[9] from Rona and Takahashi's figures calculated the solubility of calcium for the conditions obtaining in blood plasma as 2.2 mgs. per 100 cc. Brinkman and Van Dam[10] measured the actual concentration of ionized calcium in serum by a special method. They found a concentration of 2.2 mgs. of ionized calcium per 100 cc., thus agreeing with the value calculated by Rona and Takahashi. They stated that about 25% of the calcium was present as a colloidal calcium-protein compound. Both Brinkman and Van Dam and Michaelis considered that the calcium not in the form of a calcium-protein compound and not ionized must be present in the form of non-dissociated but truly dissolved calcium salt ($Ca\ (HCO_3)_2$). While the exact distribution of calcium in the blood serum is still undecided it has been clearly shown that the ionization of calcium in serum depends not only upon the total calcium concentration in the serum, but also upon the concentration of the hydrogen and bicarbonate ions.

Collip and Backus[11] in a study of the tetany induced by forced breathing considered that there was a mild alkalosis as measured by a decrease in the ratio $\frac{CO_2 \text{ tension of alveolar air}}{CO_2 \text{ combined of plasma}}$, the carbon dioxide tension of alveolar air being considered to be in equilibrium with the dissolved carbon dioxide. Collip[12] made the interesting suggestion that this change toward an alkaline reaction might, by disturbing the kation equilibrium, make the calcium ion less available in the tissues and result in increased neuromuscular irritability. Grand and Goldman[13] in the same type of experiment showed a definite increase in the alkalinity of the blood by pH determinations. They measured the calcium concentration of the serum and found no decrease, in fact they demonstrated a slight increase. These authors considered the possibility that, with the lowered carbon dioxide tension of the blood from over ventilation and resulting alkalosis, a portion of the calcium might be precipitated or in some way rendered inactive, although still present in the blood. However, they summed up by leaving the rôle of calcium unexplained and considered that the underlying factor in this condition was the alkalosis.

Freudenburg and Gyorgy[14] were the first to apply the formula of Rona and Takahashi to the explanation of tetany. These authors considered that under normal conditions calcium in the body cells is mostly bound to the tissue proteins. Any condition which removes this calcium from the protein of muscle and nerve cells results in increased neuro-muscular irritability. They considered that the ionized calcium of the blood was in equilibrium with the bound calcium of the tissues. Therefore any marked reduction in the ionized calcium of the blood would result in withdrawal of calcium from the tissues and resultant tetanic symptoms.

In discussing the work of Freudenberg and

Gyorgy one feels that they deserve credit for emphasizing the importance of the ionized calcium of the blood. Their explanation of the mechanism involved is, however, open to criticism. In the first place it is difficult to accept their explanation as to the manner in which a reduction of the ionized calcium produces tetany. A change of the pH of the blood in the direction of alkalinity will necessarily result in a concomitant change in the tissue fluids, whose pH varies very slightly from that of blood. This would result in increased binding of calcium by protein in the cells rather than the removal of calcium. In fact they themselves have experimentally shown this[15] and their explanation of its different action *in vivo* is unconvincing. It is more likely that the simple reduction in the ionized calcium of the blood and extra cellular fluids bathing the cells results in an increased neuro-muscular irritability. These authors have also summarily disposed of calcium determinations on serum as valueless, quoting the work of Denis and Talbot[16] to show that low calcium values were found in other conditions in children such as pneumonia as well as in tetany. It has been clearly shown, however, by Howland and Marriott[5] that a low calcium in serum is a constant finding in infantile tetany and that in no other conditions except occasionally in nephritis and after parathyroidectomy are values below 7 mgs. per 100 cc. obtained. These authors also demonstrated that there was no change in the pH of the blood in this type of tetany. I have never found an increase in the bicarbonate of the blood in infantile tetany. Therefore it is probable that the low absolute calcium value of the blood in this condition results in a low ionized calcium, the other factors of the Rona and Takahashi equation being fixed. Freudenberg and Gyorgy made no attempt to explain infantile tetany It is significant that in one experiment on infantile tetany by Gamble and Ross (unpublished work) the administration of ammonium chloride stopped the symptoms without increase of the calcium in the serum. The bicarbonate was greatly reduced and this probably brought about an increase of the ionized calcium.

If one assumes, therefore, that the symptoms of tetany are the result of a diminution in the ionized calcium in the blood, it supplies an explanation for the occurrence of a number of types of tetany which hitherto have apparently had no common basis.

In the tetany from over ventilation of the lungs the reduction in the H-ion concentration (increase in alkalinity) is relatively greater than the reduction in the bicarbonate ion. Therefore calcium ionization is reduced and tetany results.

In "gastric tetany" the bicarbonate ion concentration is increased and as a result a reduction in the calcium ion takes place. In my cases there was a marked increase in the bicarbonate concentration of the blood. Unfortunately no pH determinations of the blood were made so that we do not know whether a true alkalosis with reduction in the hydrogen-ion concentration was also present. This, if present, would still further favour a reduction in the ionization of the calcium. As previously noted the absolute calcium values for the blood were normal. The effect of ammonium chloride injections in one case was to reduce the bicarbonate ion and possibly shift the reaction of the blood in the direction of acidity. Both these factors would increase the ionized calcium of the blood and stop tetany.

An increase in the phosphate ion of the blood probably acts in the same way as the increase in the bicarbonate ion: It reduces the calcium ionization and if this is carried far enough tetany results. We might here note the work of Binger[17] who produced tetany in dogs by the intravenous injection of phosphate solutions. He found, however, that if the solution injected were more acid than pH6 no tetany resulted, although in all cases he was able to reduce the calcium of the serum from its normal level to between 6-7 mgs. per 100 cc. From this it appears that the administration of acid phosphates increased the hydrogen ion concentration of the serum, so that even with an absolute decrease in the calcium concentration there was sufficient ionized calcium to prevent tetany.

In the two cases of acute nephritis following bichloride poisoning we have an interesting contrast. Two factors probably favoured the production of tetany in the first case. In the first place there was a marked retention of inorganic phosphorus in the serum and a low calcium concentration. This phenomenon has been shown by Marriott and Howland[4] to occur in severe forms of nephritis. The reduction in the calcium probably is produced by the increase in the phosphate ion. This follows the principle of the solubility product constant for slightly soluble salts. In the second place the injection of sodium bicarbonate by increasing the bicarbonate ion would tend to diminish the ionized calcium in a blood already low in absolute calcium concentration with resulting tetany. In Case 5 there was only a moderate phosphate retention and a slightly low calcium concentration with no evidence of tetany.

From the above evidence it appears probable that the part played by calcium in the production of tetany depends upon the ionized form of this element. The evidence brought forward is indirect, and until direct measurements of ionized calcium in the serum are available the proof is not possible.

Treatment in Tetany

A word as to the treatment in tetany. In infantile tetany Howland and Marriott[5] have shown the value of calcium chloride in abolishing the symptoms of tetany and in raising the calcium content of the serum. It probably serves a double purpose. It raises the absolute amount of calcium in the blood and reduces the bicarbonate. Both these factors would tend to increase the ionized calcium.

In the types of tetany where the calcium value is normal, substances which will reduce the bicarbonate and tend to increase the acidity of the blood are required. Among these are calcium chloride, ammonium chloride and hydrochloric acid. These may be given by mouth. If conditions are such that no absorption takes place as in pyloric obstruction or in continuous vomiting, ammonium chloride may be given intravenously. The solution must be isotonic and neutral. We should here suggest the probable value of the neutral salt sodium chloride in some of these cases. We have found in the cases described in this paper an absolute reduction in the base of the blood as measured by sodium (which constitutes 95% of total base in the blood). Hastings, Murray and Murray[1] and Gamble and Ross (unpublished work) have found the same condition in dogs with pyloric obstruction. In view of the great many functions which an adequate base concentration in the body fluid fulfils it would seem logical to bring this up to normal. Some experimental data supports this view. MacCallum[2] in experimental tetany in dogs with pyloric obstruction found that the symptoms of tetany could be prevented or relieved by sodium chloride injections, whereas the injections of hydrochloric acid were much less satisfactory. He was unable to give an explanation for this. Gamble and Ross (unpublished work) have compared the effect of ammonium chloride and sodium chloride injections (intraperitoneal) on dogs with tetany from pyloric obstruction. Both these salts relieved the symptoms of tetany, but the dogs who were given ammonium chloride died after a few hours, whereas those who were given sodium chloride lived comfortably for days. As mentioned above, these dogs all showed a lowered base content in the serum as measured by the sodium. This fell steadily until death. Following the injection of ammonium chloride the base continued to fall although the chloride content of serum rose and the bicarbonate fell. Where sodium chloride was given the base in blood remained at an almost normal level, and not until this began to drop did the dog show symptoms of malaise. At the same time the bicarbonate and chloride values remained almost constant. It appears, therefore, that the logical treatment in these cases is to hold up the level of the sodium and chlorine in the blood by administration of sodium chloride, and as an emergency measure a reduction of the bicarbonate may be brought about by such substances as hydro- chloric acid, ammonium chloride, or calcium chloride until the normal equilibrium between kations and anions has been reestablished by sodium chloride.

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ACUTE LEUKAEMIA IN A CHILD*

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THE following case illustrates the essential features of leukaemia as it occurs in infants and children.

Case No. 27492.—Charles O.,—aged 6 years, was admitted to the Hospital for Sick Children, November 14th, 1921. His family history and past history had no bearing on the present illness.

Present Illness: Father observed that the boy appeared rather listless for the past four months, but until recently he thought it was just due to laziness. Slight pallor was noticed the middle of September. About October 1st, the patient complained of headache, and pain in both shin bones, and the following week complained also of sore throat and pain in the right side of chest. He slept a great deal and became tired with the least exertion. About October 21st, the abdomen was observed to be more prominent than usual. The symptoms gradually became more marked and on November 13th, the patient was delirious for a time. He was admitted to the Hospital for Sick Children the following day.

Physical Examination on Admission: The patient is a well developed and fairly well nourished boy with moderate pallor of the skin and mucous membranes. There are fine petechial haemorrhages over the anterior surface of the neck and chest and also a few haemorrhages on the right leg just below the knee. Some bloody crusts are present in both nares. There is general enlargement of the cervical, axillary, epitrochlear and inguinal glands. Some of the axillary glands are about 5 m.m. in diameter. The gums and teeth are in fairly good condition, although some pyorrhoea is present. The tongue and pharynx appear normal and the tonsils are buried. The lungs are clear. The heart is not enlarged and no murmurs are heard. The abdomen is quite distended and the superficial veins are prominent. Some tenderness is present on palpation over the epigastric region. The liver extends to 2 c.m. above the level of the umbilicus (8 c.m. below the costal margin) and the spleen 5 c.m. below the costal margin. Nervous, genito-urinary and osseous systems are apparently normal.

November 17th.—The liver and spleen have both increased in size since admission. The liver now extends to 2 c.m. below the level of the umbilicus (12 c.m. below the costal margin) and fills the greater part of the right side and epigastric region of the abdomen. The spleen extends to 8 c.m below the costal margin and is quite firm. The patient had a haemorrhage from the nose on November 15th.

November 18th.—Petechial haemorrhages on neck are darker. There is slight bleeding around left lower incisors. Priapism is present.

November 19th.—Priapism is still present. Petechial haemorrhages are present on the back. There is some bleeding from the right upper incisors. The liver extends to 13 c.m. below the costal margin. The general glandular enlargement has not increased perceptibly. No heart murmurs are heard.

November 21st.—Has been vomiting yesterday and to-day. Priapism is still present.

November 22nd.—The spleen and liver have both diminished in size. The spleen extends to 5 c.m. below the costal margin and the liver 11 c.m. There is bleeding from the gums. Has vomited brown fluid streaked with bright red blood. Priapism is still present.

November 23rd.—There has been profuse bleeding from gums and nose. The pulse is barely perceptible. A systolic murmur can be heard over the praecordium. Liver is palpable 6 c.m. below the costal margin. The spleen cannot be felt. Died at 3 p.m.

Blood Examination

Date	*Red Blood Cells*	*White Blood Cells*	*Hbg. per cent*
Nov. 15......	2,110,000	272,000	55
Nov. 17......	2,460,000	427,000	50
Nov. 19......	—	665,000	—
Nov. 20......	2,090,000	642,000	45

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*From the Wards and Laboratories of the Hospital for Sick Children, Toronto, Canada. Read before the Section of Pathology, Academy of Medicine, Toronto, October, 1922

Examination of the blood smears: The red blood cells show some anisocytosis and poikilocytosis. A very occasional nucleated red blood cell is seen. Very few platelets are present. The normal polymorphonuclear neutrophils constitute about five per cent., and the normal small lymphocytes somewhat less than five per cent. of the total white blood cells. About ten per cent. neutrophilic myelocytes and an occasional eosinophilic myelocyte may be counted. Great numbers of immature cells are seen which vary considerably in size, the majority, however, being a little larger than a normal polymorphonuclear neutrophile. The nuclei of these cells are large and very finely reticulated. With the Wright stain they stain a faint pink-purple. Three or more nucleoli are present in the majority of these cells. The protoplasm is scanty and as a rule stains a faint blue but in some cells stains a dark blue. A few ruptured cells are present. The blood picture remained essentially unchanged throughout the period of observation.

The majority of the haematologists to-day believe in the dualistic theory of the origin of the white blood cells. They consider that the lymphocytes, which are non-granular, are produced from the lympho-poietic tissue and the polymorphonuclear cells, which are granular, originate from the myelo-poietic tissue. No granules are visible by the ordinary staining methods in the myeloblast which is the precursor of the myelocyte from which in turn the polymorphonuclear cells are formed. The myeloblast, however, except when very immature, can be differentiated from the lymphocyte by the use of the oxydase reaction originally advanced by Winkler and applied to the blood and tissues by Schultze, Evans, and Graham. By the use of this reaction, granules show up quite definitely in the myeloblasts, while the lymphocytes are not affected.

The immature cells seen in the present case might be either myeloblasts or immature lymphoid cells. Here the oxydase reaction showed only about ten per cent. granular cells, practically all the large monuclear forms having no granules. This does not rule out the possibility that these large cells may be myeloblasts as it is well known that the oxydase reaction is of little value in differentiating the very young forms of cells.

Autopsy.—The following notes from the autopsy report by Dr. I. H. Erb, Pathologist to the Hospital for Sick Children, are of interest.

The liver extends to 6 c.m. below the costal margin and the cut surface is pinkish-red in colour. The lower border of the spleen is 1 c.m. above the costal margin. The surface presents a wrinkled appearance as though the spleen had recently diminished in size. The cut surface is also reddish-pink in colour. There is enlargement of the mesenteric and bronchial glands. In the gastro-intestinal tract the solitary lymph follicles and Peyer's patches are considerably enlarged and very firm. These changes are most marked in the terminal two feet of the ileum. No haemorrhagic areas are present in either the large or small intestines but there are numerous sub-mucous petechial haemorrhages in the stomach. These are most numerous in the region of the fundus. There are no areas of ulceration.

There are numerous haemorrhagic areas in the sub-pericardial tissues, particularly over the left side of the heart. Petechial haemorrhages are also present under the endocardium of the right auricle and right ventricle, but no haemorrhages under the endocardium of the left side of the heart. The lungs show some oedema and congestion posteriorly. A portion of the sacrum was removed for microscopic examination, and the cut surface was seen to be pinkish-yellow in colour.

Microscopic examination of the tissues shows marked infiltration with the same type of mononuclear cell present in the blood. This infiltration is most marked in the liver, kidneys and lymphatic glands. In the liver it occurs chiefly around the periphery of the lobules. In the kidney it is present in the interstitial tissues while in the lymphatic glands practically the whole of the normal gland tissue has been replaced by these cells. In the lymphatic glands particularly, there are also present fairly large numbers of eosinophilic myelocytes and some neutrophilic myelocytes.

DISCUSSION

Leukaemia in children is practically always acute. Myeloid leukaemia is unusual, eighty to ninety per cent. of cases being lymphoid in type. It is seen that the white blood count in our patient is quite high. The count, in about fifty per cent. of cases of lymphoid leukaemia, is normal or even sub-normal. The lymphoid cells in these instances, however, constitute over ninety per cent. of the total leucocytes. The blood picture from our case presents unusual difficulties in differentiating the type of leukaemia present, and it is impossible from this alone to make a definite differential diagnosis between lymphoid and myeloid leukaemia. However, from the clinical picture (the bone pains and the great enlargement of the spleen), together with the tissue sections, it is probable that the case belongs to the acute myeloid type.

Clinically, the essential features of leukaemia as it occurs in infants and children, are here illustrated. In regard to the onset, a study by the author of a number of cases of this disease, clearly demonstrated that leukaemia most frequently begins with weakness and pallor. In the present instance these signs were observed some weeks before any other symptoms appeared. The older children usually complain of headache. This was the first definite symptom of which our patient complained. Enlargement of the abdomen and haemorrhages are the initial signs in only a small per cent. of cases. In the present case, these signs did not appear until after the other symptoms had become well marked. Although the onset could scarcely be termed abrupt the severity of the symptoms increased with great rapidity.

In practically every case of leukaemia pallor of the skin and mucous membranes is present. Frequently the skin assumes a peculiar lemon yellow colour, which is due to the marked reduction in the number of red blood cells and the total haemoglobin. Only a moderate degree of pallor was present in our patient. The spleen is enlarged in almost every case of leukaemia, although in only thirty to forty per cent. of patients is the enlargement as marked as was found in the present instance. In the majority of cases the lower border of the spleen is from one to five c.m. below the costal margin. The next signs in order of frequency are enlargement of the liver and of the superficial glands. The increase in the size of the liver occurs almost as frequently as enlargement of the spleen, although as a rule the degree of enlargement is less. The superficial glands are usually enlarged but rarely exceed 1.0 c.m. in diameter. Haemorrhages from the nose and mouth, and ecchymotic areas or petechial haemorrhages of the skin are present in about fifty per cent. of cases. These signs, as well as those discussed above, stand out clearly in the picture presented by our patient, and the whole constitutes a typical clinical example of this disease in a child.

The author wishes to acknowledge his thanks to Dr. Alan Brown, Physician-in-chief, for permission to report this case.

SOME POINTS IN THE DIAGNOSIS AND TREATMENT OF HYPERTHYROIDISM

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THE effects of hyperthyroidism are chiefly confounded with the symptom neurasthenia. Many a patient has been given bottle after bottle of tonic to cure a "run-down" condition, who was suffering from incipient hyperthyroidism, and both doctor and patient wondered why improvement did not take place; or the patient was put in the class of neurasthenics and treated with indulgence and some fatherly advice. However, to-day as the symptoms of hyperthyroidism have become better known, the diagnosis of the disease is easily made. To those who have access to a basal metabolism machine there should be little trouble. The following case will illustrate the need for differentiation:

> Mrs. E., age 41; married; no children; slight build; has had periodic nervous breakdowns; now comes with history of being easily tired; short of breath; fine tremors in hands; and says that when she exerts herself has a trembling feeling all through her. Has a small goitre; pulse 96; weight 115 lbs.

A very suspicious history, but the basal metabolism test revealed a rate of —1. This case was put on tonics with a little thyroid added, and made a splendid recovery. Without the metabolism test, this case would undoubtedly have been regarded as one of hyperthyroid trouble, and might have been subjected to a needless operation. Another case will illustrate the advantage of the test in differentiating a thyroid from a heart case.

> Mrs. S. M.; age 39; two children; always inclined to be anaemic. Goitre began at fifteen years. At age of thirty-two goitre was quite large. Had tonsil trouble for two or three years. Tonsils removed at thirty-six. Had 'flu shortly after and since then has had palpitation and shortness of breath; also easily tired. During the last two years, the goitre has decreased somewhat in size, pulse varying from 108—120. Metabolism rate—+20.

Here the history of influenza, with the presence of an old goitre made it difficult to say whether the heart symptoms were a sequel of 'flu or due to hyperthyroidism. The basal metabolism test decided in favour of the thyroid.

There are other means of determining the presence of hyperthyroidism although none so accurate. The Goetsch test of injecting ½ c.c. of adrenalin subcutaneously and watching for the signs of acute hyperthyroid effects is a valuable one, but should never be done in the office. If positive, this test uses up all the strength of the patient and he should be kept in bed for at least the day following. A case illustrates the value and also the danger of this test:

> Mrs. K. C., age 28; three children, quite well until a year ago; developed marked enlargement of thyroid; became easily tired, short of breath; weight decreased from 156 to 126. Pulse, 100. As no metabolism machine was available, was given the Goetsh test. This left the patient so weak that she collapsed on the way home. Pathological report after operation was "diffuse hyperplastic goitre."

Another simple method is to give thyroid substance for two or three days, taking the pulse rate and blood pressure previously. Marked accentuation with increase in pulse rate and blood pressure means an already increased thyroid secretion. This method is not so accurate as either of the two foregoing.

If the thyroid takes part in the effective destruction of the toxins of disease, then it seems reasonable that the first step in treatment of hyperthyroidism should be to lessen its activity by removing the source of the toxins. Hence, removal of diseased tonsils, treatment of pyorrhea, and the overcoming of colonic stasis, if any, or all exist, are the first lines of treatment. If the hyperthyroidism is slight, this treatment, together with rest, may be sufficient to effect a cure. With this is combined medication consisting of quinine hydro-bromide, calcium lactate, and ergotin.

Periods of remission in hyperthyroidism are probably due to the enforced rest of the system caused by the inability to carry on, thus allowing a slower circulation, a lessened activity on the part of the gland, and the gradual building up of the resistance of the body, which leads to subsidence of activity in the area affected. Any reinfection or breaking down of the resistance of the system by too great exertion or worry means increased toxins, with a consequent increase in thyroid secretion with its train of symptoms.

Failing to remove the cause, or finding that the changes in the thyroid are so great that removal of cause no longer means a sufficient lessening of output, we must look for other methods of control. At present X-rays are being widely used for this purpose. The effect of X-rays on the thyroid is probably two-fold. It causes destruction of the new gland cells which have been formed, and, in addition, it causes increase in the connective tissue between the lobules, thus interfering with the lymphatic circulation by which the secretion reached the blood. Theoretically, this line of treatment should be ideal. Practically, it has not so worked out. Unless X-rays of sufficient strength are given to kill all the new cells, the disease, after a longer or shorter period of quiescence, again becomes active upon the slightest stimulation. If, on the other hand, sufficient is given to destroy the new cells, it must be remembered that the regular gland cells are also affected and the inter-lobular connective tissue is much increased shutting off the lymphatics, and there is now hypo-thyroidism. A case in point is the following:

> Miss L., age 23; symptoms of hyperthyroidism; one lobe removed; patient better for a time, then symptoms recurred; ligation of superior artery, followed by X-rays. Some months after the examination by metabolism test gave —7 rate.

My experience with X-rays leads me to believe that they should be chiefly used to modify serious cases so that they may be operated upon with safety. This brings up the question of when an operation should be performed, and it is in this regard that the basal metabolism rate is most useful. A high rate is a contraindication to removal, and X-ray ligation, or simple rest must be used until such time as the rate is down to a safety point. I believe that a rate of less than +40 should be obtained before removal is done. Naturally, the lower the rate, the less the risk. A word of caution regarding the metabolism test is needed. In these cases a single test is, I believe, misleading, and an average struck from the results of three or four tests will give a more exact idea of the true metabolic rate. I have found as much of a drop as 20% in rate between the first and second tests, the latter being taken on the succeeding day.

In such cases as do not respond readily to medical treatment, operation remains the method of choice, and X-rays should be used chiefly as a preparatory course. For several years I have practised the resection of both lobes in preference to removing one lobe. It gives a symmetrical result and removes more of the tissue which may be hyperplastic. In doing this, the superior thyroids are ligated and the upper poles resected, then after clamping the veins the capsule is inside at a point which will give sufficient flap and a V-shaped section of the lobe is made. This method does not cause as much haemorrhage as one would expect. A branch of the inferior thyroid about the middle of the posterior section, and frequently one from the superior artery near the upper pole, will need to be ligated. After checking the bleeding, the outer flap of the capsule is brought over and sutured to the inner which lies along the trachea.

The great risk of the operation is in the increased absorption which takes place from the raw areas of the gland itself, and also from the fascial planes which have been opened up, and over which the blood and secretion from the thyroid cells spread. Recently, I have adopted two methods of preventing this absorption. The first is to coagulate the albumen of the surface cells of the wound by packing in sponges soaked in pure alcohol. This coagulated layer tends to prevent absorption of the secretions. The other measure is to remove the secretion until nature has had an opportunity to build up a protecting wall. This is done by utilizing the principle of osmosis which induces an outpouring of plasma and lymph, and in this way carries off the secretion which would be otherwise absorbed. A small Dakin's tube is used carrying two small rubber tubes to either side of the trachea. To the end of the Dakin's tube is attached a small rubber tube which is brought out through the dressings and kept covered with sterile gauze, The insertion of these tubes does not in any way interfere with the closing of the wound by means of a sub-cuticular suture. The after-treatment consists of flushing the wound with a hypertonic salt solution every hour. This is done with a small syringe. The injection of this solution not only washes away the secretion which oozes from the cut surface of the gland, but, in addition, causes an outpouring of fluid from the surrounding tissues, which effectively prevents absorption. My experience with this form of after-treatment is such that I believe the severity of operative procedures in serious cases is greatly lessened thereby.

A CASE OF PRIMARY SARCOMA OF THE HEART*

L. G. Pinault, M.D., F.A.C.S.

Campbellton, N.B.

MRS. D., aged forty-seven, came to the hospital suffering from a generalized oedema, marked dyspnoea and a disturbance of digestion. The first symptoms began two months previously with dyspnoea, and swelling of lower limbs and abdomen. Family and personal history were good.

Physical examination revealed oedema of both legs, both arms, and of the whole trunk, the right side of the body being more swollen than the left; there was a large amount of free fluid in the peritoneal cavity and a considerable effusion in the right chest. The edge of the liver was felt two inches below the ribs. The heart sounds were regular but faint and gave the impression of being heard through a hydropericardium. Pulse was regular but weak and very compressible. The respirations were short and embarrassed. The left lung was apparently norman; the right side was dull to percussion and no breathing sounds could be heard. The radiograph showed the right side filled with fluid, and mediastinal and heart shadows larger than normal. The diagnosis was made of myocarditis with the probability of a mediastinal tumour interfering with venous return. Ascitic fluid on examination was found to contain numerous lymphocytes. The urine had albumin and acetone; the blood count gave 4,800.000 R.B.C., and 13,800 W.B.C.

Several aspirations were made to relieve the ascites and pleural effusion and the patient was given various heart stimulants but died four weeks after entering the hospital.

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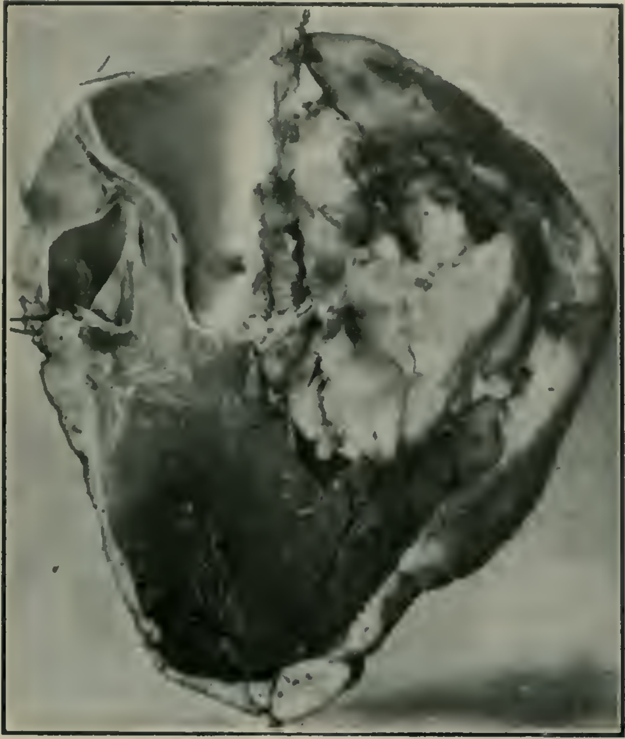
*Reported to New Brunswick Medical Society

Post mortem: The right chest was completely filled with bloody serum and the lung retracted to the size of the fist. The left pleural cavity was normal excepting a few adhesions of the lung to the parietal pleura. The mediastinum contained a mass of hard enlarged lymph nodes entangling the large blood vessels at the base of the heart. The heart was enlarged and its whole surface was whitish and seemed covered with a coat of fat. The base of the heart was irregular and hard. The right auricle was distended by a grayish tumour the size of a hen's egg which completely filled its cavity. The left auricle, both ventricles and the valves were apparently normal. The abdomen was negative excepting the liver which was slightly hypertrophied and of a nutmeg colour.

Section of the tumour examined by Dr. Abramson, provincial pathologist, showed it to be a round-celled sarcoma.



Primary round-celled sarcoma of the heart

Primary tumours of the heart are very rare and Hektoen who reported three cases in 1893, states the reports of only 110 cases of cardiac tumours were to be found in the index catalogue of the Surgeon General's library and most of them were secondary.

Hirschfelder states that Berthenson collected twenty-eight primary tumours of the heart, nine of which were sarcomata; and Link, in 1919, collected ninety-one cases, thirteen of which were sarcomata.

As to the symptoms of heart tumours Hirschfelder says that clinically the presence of a tumour in the heart in itself exerts little influence, unless, as in a case of sarcoma reported by Luce, it presses upon the auriculo-ventricular bundle and produces heart-block, or it is so situated as to produce either stenosis or regurgitation at a valvular orifice. E. Meroz, writing in 1917 on primary tumours of the heart, reported one case of a spindle-celled sarcoma that was primary in the heart, and he gives a brief summary of the literature on primary cardiac growths. He also says that if the tumour occupies a position which does not interfere with the heart's action, it will not set up any morbid phenomena; but if it occludes the cardiac orifices, then symptoms of stenosis or insufficiency will arise. The only symptoms noted have been disturbances of the venous circulation.

The most complete article we have found on the subject of sarcoma of the heart is one by Dr. I. Perlstein, of Chicago, published in 1918. He gives a clinical description of all the reported cases and the references thereto, and adds a case of his own.

He says in the opening paragraph of his article that tumours of the heart have never been diagnosed in the living patient, as a review of the literature shows. He adds that the first sarcoma of the heart was reported by Bodenheimer in 1865, and since then only twenty-nine were reported up to 1918. As to symptoms, Perlstein says: "That a clinical diagnosis of tumour of the heart has never been made can be explained by the fact that this pathological condition does not produce a characteristic picture. Frequently these patients do not present any, or very few, symptoms suggesting cardiac trouble. Some die suddenly and without having shown any signs of the disease, and the cardiac tumour is then found on the autopsy table as a surprise. In some cases the symptoms appear suddenly and death occurs in a short time." He further reports what we have already quoted from other writers as to the symptoms depending upon the location and the size of the cardiac tumour.

In his conclusions Perlstein says: (1918)

"1. Only thirty cases of sarcoma of the heart were found after a careful search of the literature. To these is added a case in which the tumour originated apparently in the sub-epicardial areola tissue. 2. There is no characteristic clinical picture for the condition. The symptoms are mostly those of a seriously disturbed cardiac activity. Excessive and repeated haemothorax was the most striking clinical feature of the cases reported. 3. Sarcomas of the heart occur at all ages, but are most common in the vigorous years of life. 4. Histologically all types of sarcoma have been reported. The spindle-cell variety is the one most frequently found. 5. They occur more often in the auricles than in the ventricles, and more frequently on the right than on the left side. 6. Among the postmortem findings, pericardial and pleural effusions and oedema are common."

A NEW CYSTO-URETHROSCOPE FOR EXAMINING AND OPERATING ON ANY PART OF THE URINARY TRACT BY DIRECT-TELESCOPE OR INDIRECT—PERISCOPE METHODS*

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CYSTOSCOPES and urethroscopes of numerous makes and designs on the market today are so nearly perfect in construction, that one must be very sure of one's ground before offering to add to their number. The one thing lacking so far is, that no single instrument takes the place of all the others required for complete urethral, cystoscopic or ureteral work.

This instrument needs to be inserted only once for no matter what examination or operating is to be done; it can be used with a telescope or a periscope without withdrawal and reinsertion; it reduces the total number of working parts and simplifies them; it allows stronger instruments to be used; and withal, which has been most difficult of attainment, the instrument, it is hoped, is as good as the best for any use to which it is put. This balancing of the different requirements of the combined instrument so that it does not degenerate into a make-shift for some purposes while excellent for others is what has taken up time and experiments for the last ten or twelve years.

During this period others working independently have brought out improvements similar to those incorporated herein. There is hardly any part of the instrument which, in some form or other, is not on the market somewhere; *e.g.*, Geringer's endoscope perhaps the most perfect of its kind to-day, came out while I was using the same principle in a model which is still doing daily duty; the ureteral meatotome, I am informed, is much the same as one in use in Italy; and, finally, the straight heavy instruments to be used with the telescope are on the same lines as the Papin operating cystoscope which was manufactured, perhaps as long ago as when I first began to use this principle.

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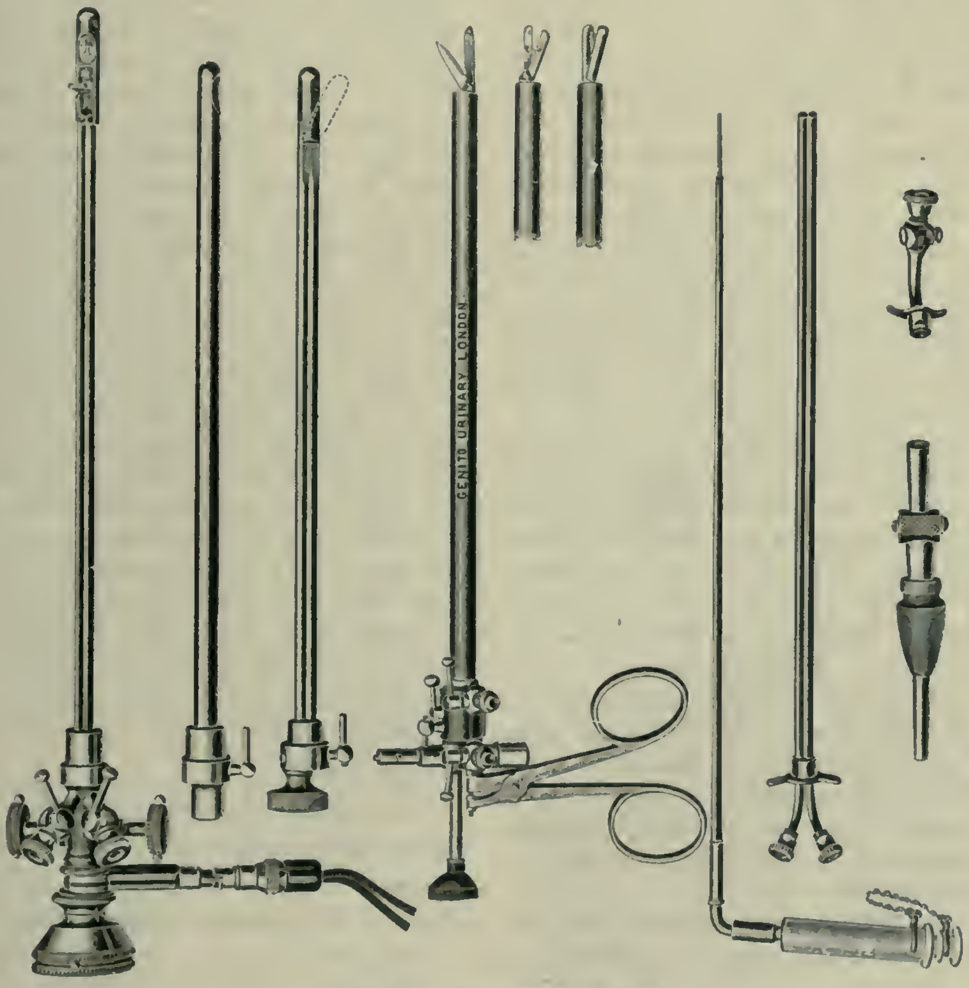
*Presented at Canadian Medical Association Meeting, Winnipeg, June 23rd, 1922.

The introduction of any instrument into the bladder is accompanied by more or less discomfort which sometimes amounts to pain requiring a local or general anaesthetic to control. Often the least instrumentation possible is called for. It is even questionable at times whether it is advisable to cystoscope at all so much harm may be done by cystoscopy. Therefore, there is a call to-day for an instrument with which one can accomplish the maximum at one sitting.



Gordon. Cysto-urethroscope

A pleasant surprise awaits those who have not used the open ended, water dilating posterior endoscope. Through this not a patch of the urethra only, but the whole circumference is seen in a field large enough to embrace both abnormal and normal areas, so that any lesion present contrasts with its environments.

Those who have used the wiggly tools supplied with all operating periscopes will appreciate this system which allows larger, stronger, and simpler ones to come directly into the field of vision by a single thrusting movement.

This cysto-urethroscope is housed in a tube of 24 calibre (French) to introduce which through the urethra into the bladder an obturator with curvable beak is used. Straighten the beak, withdraw the obturator and leave this sheath in place. The urine escapes. Insert the irrigating nozzle into the tube up to the rubber stopper and fill the bladder. Withdraw the irrigating nozzle to drain the bladder, if it is foul, and repeat filling and emptying the bladder until the outflow is clear. Lastly keep the bladder filled with clear solution, by holding the left thumb over the outlet of the sheath. The right hand lays aside the irrigating nozzle, takes up the periscope and carries it quickly and smoothly home in the sheath (the left thumb having been removed at the last moment). Should too much fluid have escaped in this manipulation leaving the bladder insufficiently distended, or should one prefer to have a stream of fluid flowing constantly and directly over the field of vision while cystoscoping, insert the tip only of the irrigating nozzle into the small rubber tube attached to the open side tap. Should the bladder get too full during manipulations turn off the inflow and loosen the periscope in its socket sufficiently to allow the superabundant fluid to escape. The periscope is used for examining, for catheterising the ureters, or for fulguration.

The light will be found good, the field large and clear and the catheter carrying tubes of ample size to carry number sixes.

The periscope, having served its purpose, is removed and, if required, the telescope takes its place in the sheath.

Through the tap, fluid is allowed to flow and lift the collapsed bladder off the open end of the sheath. Then the trigone can be seen *en profile* or *en face* at will. It will be found occasionally that ureters which cannot be catheterised by the indirect periscope method can be catheterised by the direct telescope method. The direct telescope method is also used if a very large single catheter or sound is to be passed.

The telescope has soldered to its sides the lighting apparatus and a return water tube (the use of which is to be explained later). Under the telescope and capable of backward and forward movement, may be inserted catheter carriers, scissors, forceps, ureteral meatotome, utricle syringe, or a hook for removing filiforms, hairpins, etc. When one of these accessories is in place under the telescope it practically forms part of the instrument so that when one brings an object into the centre of the field of vision only a forward thrust of the accessory is necessary to bring it in contact with its objective. Shearing, slitting, grasping, insertion or injection then can be easily accomplished.

When used in the posterior urethra the scope, *under direct vision*, is gradually withdrawn from the bladder, care being taken that distending fluid, under a few feet of pressure, is continually flowing through the sheath to dilate the internal sphincter and posterior urethra. The amount of distention can be easily regulated by the height of the irrigator and by the tap on the side of the sheath. If the bladder, into which the distending fluid has flowed, gets uncomfortably full, it is to be emptied by carrying the scope back into it, closing the tap and loosening the telescope in its sheath. Resocketing the telescope, and reopening the tap permits renewed examination or work on the posterior urethra. The scope can usually be carried back and forth in the posterior urethra, if distention is kept up, with only slight discomfort to the patient. Bullae, papillomata, sinuses, ulcers, congested areas, distortion from scars or adenomatous bulgings, inflammation of the utricle, stricture etc., can be all clearly differentiated, when present, through this form of endoscope and remedial instrumentation done where indicated. Finally, on withdrawing it through the external sphincter, the scope can be used as an anterior endoscope, by making use of the extra tap as an evacuator of the distending fluid. Pressure in the anterior urethra can be regulated by manipulation of the inflow and outflow taps.

Thus at one sitting, beginning at the bladder and working out, one can examine or operate on any part of the urinary tract.

I think the irrigating nozzle is worth calling attention to; it can be used with any irrigating cystoscope to carry fluid directly through the main tube or through the taps at will. It will be found very useful where large quantities of fluid are required to flush out and clean a very dirty bladder quickly or to flush the field of vision under direct observation when cystoscopy is under way.

The Cystoscope presented to-day is one of half a dozen being made throughout, under my personal supervision, by the G. U. Mfg., Co., Ltd., of 66, Margaret Street, Oxford Circus, London, W. 1.

TETANUS

John W. S. McCullough, M.D., D.P.H.

Chief Officer of Health, Province of Ontario

THE report of the following case of tetanus abstracted from the December 22nd, 1922, number of the *Journal of the American Medical Association* (Goler and Reitz) is of sufficient interest to warrant perusal.

"E. W., a man, aged 27, with a negative history, had a root filling put in a tooth, January 3rd, 1922. January 15th, the neck became stiff, and he was unable to open his mouth. On the 16th, he began to have tonic and clonic spasms, involving all the muscles of the body, particularly the extremities and abdomen. Thirst increased, sweating became profuse, and there was great irritability. On the 19th, 11,000 units of tetanus antitoxin were given subcutaneously by a local physician. January 22nd, he was removed to the Park Avenue Clinical Hospital, Rochester, where a diagnosis of tetanus was made. The spinal canal was tapped, and he was given 4,000 units of tetanus antitoxin intraspinally, 11,000 intravenously and 20,000 subcutaneously. The filling was immediately taken from the dead tooth, which was extracted on the following day. He was given 200 c.c. of a 25 per cent. solution of magnesium sulphate subcutaneously and morphin as necessary in one-fourth and one-half grain doses. January 25th, 26th and 27th, he was given tetanus antitoxin subcutaneously, 10,000 units each day. On the 24th, his tonic spasms had become less frequent, the muscles of the abdomen and the extremities began to relax, the jaw could be more widely opened, thirst was not so constant, and sweating was less profuse. From this time on, the patient made an uneventful recovery."

The same article calls attention to papers by Park and Nicoll, and by Meltzer, published in Vols. 63 (page 235) and 66 (page 931) of the same Journal.

The former of these articles emphasizes the value of repeated intraspinal injections of tetanus antitoxin in conjunction with its use intravenously and subcutaneously. The latter one calls attention to the inhibitory action of a solution of pure magnesium sulphate used subcutaneously. The author summarizes the plan of treatment of cases of tetanus as follows:

> "The best general plan for treatment of tetanus would seem to be as follows:
>
> In each and every case of tetanus, 1.2 c.c. of a 25 per cent. solution of magnesium sulphate should be given by subcutaneous injection three or four times a day throughout the entire disease. When the disease is complicated by severe tetanic attacks, 1 c.c. of a 25 per cent. solution for every 10 kg. (20 pounds) body weight (in adults) should be given by the intraspinal method. When the disease is attended by immediately dangerous tetanic complications, from 2 to 3 c.c. per minute of a 6 per cent. solution of magnesium salts should be given then by an intravenous injection until dangerous symptoms subside or the respiration becomes shallow or too slow.
>
> When the respiration seems to become impaired in consequence of the administration of magnesium salt, by the intravenous, intramuscular or subcutaneous methods, calcium chlorid should be injected in the manner described above. It is advisable to have at hand an apparatus of intrapharyngeal insufflation ready for use, whenever the respiration becomes slow or shallow.
>
> Finally, the simultaneous treatment by antitetanic serum should not be neglected."

Result of Decompressive Trephining.—Anschütz finds that palliative trephining accomplishes nothing with quickly growing tumours and very high intracranial pressure of long standing. Some benefit is derived with slowly growing malignant processes. The results are very good in benign or stationary malignant processes, if we operate early.—*Deutsche Med. Wo.*

INDUSTRIAL MEDICINE*

Bernard Langdon Wyatt, M.D.

Laurentide Health Service, Grand Mere, Que.

We are living in what has been termed "the machinery age" and there are no problems of more vital importance to the existence of our present civilization than those concerned with the industrial units of society. It is becoming increasingly apparent that the only way in which man's estate can be improved is through the adjustment of the working environment to the worker and, in so far as may be possible, the adaptation of the workers themselves to the new conditions of employment. These adjustments and adaptations present to Universities most unusual opportunities to extend the scope of their influence and usefulness.

In 1918 a group of citizens of the city of Boston and its immediate vicinity, recognising these great needs and opportunities, made possible the establishment of a course in Industrial Medicine at the Harvard Medical School. The experience of Harvard not only demonstrated the exceptional value of this instruction but also showed the need for more extensive programmes of study. Consequently, when Harvard University received a generous endowment in the summer of 1921, it greatly broadened and extended its facilities for the training of an industrial medical personnel, and this Department is to day rendering inestimable service to industrial establishments and workers throughout the country. There are at present in the United States some eighteen colleges and Universities which give special instruction in industrial medicine and it is a matter of the greatest moment that the governing authorities of Canadian universities should be actively interested in this means of conserving the human resources of Canada which, from the standpoint of its industrial importance, ranks fourth among the members of the League of Nations.

In connection with the modern conception of the purpose of industry, it is apparent that one of the most important functions of industry is the improvement of living conditions in the life of the race struggling for existence and the recognition of this truth is to be found in the activities which business concerns are undertaking for the advancement of the comfort, health and happiness of their employees. Less than twenty years ago it was thought that there was but one fundamental factor in industry—production—but far-sighted employers have come to realize that there is another which is equally essential—and this second factor is the personnel. It is fitting in this connection to lay emphasis upon the fact that despite all improvements in labour saving devices, the human machine will ever remain the most vital and indispensable mechanism in the production of industrial wealth. Early in the Great War, the British Prime Minister remarked that it was impossible to make an A-1 Empire out of a C-3 population and it is equally certain that our great Canadian industries cannot maintain their place in the world's competition unless their employees are in good physical condition.

It is unfortunately a fact that medical teaching and medical practice have not kept up with the industrial organization of society and colleges and universities have only very recently recognized their obligations to industry and industrial workers by establishing courses of instruction in Industrial Medicine. The requirements of industrial medical practice are such that the physician in industry must be conversant with the fundamentals of industrial relations, plant organization and operation, safety engineering, employment psychology and methods, fatigue problems, industrial toxicology, sanitation, housing, pension plans, social insurance, recreational activities, etc., in addition to those matters directly related to medicine and surgery. He must be prepared to assume responsibility in connection with the prevention as well as the cure of disease and have a true conception of the obligations of industry to its workers and through them to the community and the nation.

In the ultimate analysis, the degree of success attending industrial health programmes will depend in no small measure upon the industrial physicians who are responsible for their organization and administration. It is obvious that it is to our Medical Faculties that business concerns should be able to turn, not only for adequately trained industrial physicians, but also for advice and counsel relative to the establishment of industrial health services. The physician in industry must have special instruction in order to better prepare him for his place in the existing order of society and the object of Industrial Medicine should be to make of him a social and medical engineer as well as a physician, to place at the disposition of industrial workers the best technical skill and to stimulate generally a greater interest in and a deeper appreciation of this important branch of preventive medicine from the standpoint of its social, economic and scientific aspects.

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*Abstract of Introductory Lecture on Industrial Medicine, McGill University, Montreal.

Industrial methods are classified as: (1) Domestic production; (2) Handicraft production; (3) Modern Factory system.

Domestic production in its purest form presupposes the absence of exchange and the ability of each household to satisfy by its own labour the wants of its members. Handicraft production is carried on within or outside the house, usually by free workers; the region of the sale is local—that is, the town and its immediate vicinity. The modern factory system supplies the economic wants of individuals, communities and nations by wholesale production and the aid of machinery and motive power in specially constructed plants operated by industrial wage earners.

Factory organizations vary greatly in the number of divisions or departments and in the size of the administrative and operating units, but the underlying principles are fundamentally the same in all instances. Whether the employees number 50 or 50,000, the aspects of the system fall into three separate and distinct categories. These may be defined as (1) organizational, which is concerned with the human and financial factors; (2) technical, which relates to the physical factors; (3) functional, which has to do with performance.

Let us now consider the functions and relationships of Industrial Medicine in the existing order of business affairs. A complete industrial health programme embraces activities which have been divided by Mock into two groups: (1) those directly concerned with health supervision, and (2) those which are adjuncts or auxiliaries. Under the former are the medical, surgical, dental, nursing, safety and sanitation services; while in the second group are the employment, restaurant, recreation, welfare, insurance, pension, loan, housing and community services. It is important, at this point, to emphasize that there should be nothing about industrial health work that savours of paternalism or philanthropy and later on I shall discuss both its tangible and intangible values. However, I wish to say here that its economic soundness has been proven beyond all question.

Before taking up this phase of the subject, I wish to tell you briefly about a few of the more important subdivisions of industrial medical practice. Let us consider first, accident prevention, which is a function of the Safety Service. Accident prevention in Canada is still in its infancy, whereas in Switzerland, Germany, and to a certain extent in England, the problem has long been of national importance. These governments have their official experts studying accident prevention from every angle; new laws increasing the safety of industrial workers are enacted almost every year; there are inspectors who investigate and enforce the laws; school children are taught accident prevention and colleges and universities give special courses in the subject. In a word, every means to engender a national spirit of prevention is employed. Not only should every effort be made to prevent accidents, but also, the restoration of an injured employee should be considered as being both a moral and an economic responsibility. Experience has shown that unless the officers of an industrial establishment become personally interested in accident prevention, progress in this work will be very slow. On the other hand, all safeguards, all rules, all discipline and all other safety efforts must fail without the willing and earnest cooperation of the workmen themselves.

In passing on to the consideration of Industrial Medical Services, one finds that, in addition to those matters directly related to medicine and surgery, they are ordinarily concerned with a variety of functions and interests, among which may be mentioned: Physical Examinations, Personal Hygiene, Health Education, Plant Sanitation and Occupational Research. In connection with the physical examinations, it cannot be emphasized too strongly that they are not a scheme either for weeding out employees who are beginning to wear out or for depriving handicapped applicants of a chance to get a job. As a matter of fact, the only reasons for rejecting an applicant for employment should be three: (1) when it would be a source of danger to himself, (2) to his fellow workers, or (3) to property.

The value of a healthy working force to any concern requires no comment and the benefits of these examinations to the employees are beyond all question, since through them, threatened disease is discovered while it is still preventable or at least curable, conditions are detected which make the employee prone to accidents or to cause accidents to others, the working force is protected from communicable diseases, mental or physical handicaps constituting a health hazard are brought to light, both temporary and permanent incapacity is reduced, the amount of wages lost on account of illness is cut down, and the cost to employees of their health insurance is greatly diminished.

From the standpoint of personal hygiene, the needs of each employee are discovered through the physical examinations and the necessary instruction is given to meet the individual requirements. Among industrial workers, the matter of personal hygiene merits the most careful consideration and is a factor of the greatest economic importance. In fact, those employees who are most receptive to the hygienic principles of life and work are rewarded for their efforts by enjoying the highest reaches of working power and all that it implies from the standpoint of financial returns and advantages. The success of industrial health work will be proportionate to the extent of the development by the workers of a higher sense of responsibility for the care of their bodies and since this is true, health educational activities must not be neglected. Whatever the methods employed in the dissemination of health information, the industrial nurse is the one outstanding and indispensable factor in any comprehensive plan for the presentation and application of the basic facts about correct and healthful living.

The problems concerned with plant sanitation are among the most fundamental with which Industrial Medical Services have to deal and it is the duty of every physician in industry to improve the sanitary conditions in his plant to the end that the workers will have the greatest possible protection, the company will receive the greatest possible benefits from the improved conditions and the sanitary standards of the plant will serve as a model for others. It is not intended that the industrial physician shall supplant the sanitary engineer but it is expected that every physician in industry will have some knowledge of the essential principles of sanitation and that there will be the closest cooperation between industrial physicians, sanitary engineers and operating managers in making and keeping shops and factories sanitary and healthful.

In connection with occupational research, Industrial Medical Services may render great assistance to Employment Departments by studying the factors concerned with the mentality of the worker, his physical status, the conditions of work and the working place, the materials, processes, etc., so that employees may be placed in positions which will not be prejudicial to their health.

There is one other matter that should be included in a discussion of industrial health services. I refer to the question of group insurance. The two main divisions of group insurance of interest to industry are group health and group life. The former provides weekly sick benefits for any incapacity or disability for which no compensation is payable under the Workmen's Compensation Act and the latter provides for the employee's dependents in case of death and for the employee and his family should he become totally and permanently disabled before he is sixty years of age. By means of group life insurance, for which, by the way, no medical examination is required, it is possible for employees to secure protection for about half of what it would cost them as individuals in the open market; older employees who are practically uninsurable on an individual basis are taken care of and when illness comes along or death occurs there are funds available without it being necessary to "pass the hat." From an economic standpoint, group insurance does not constitute a great expense and there are very few ways that employers and employees can combine forces to greater mutual advantage.

Before considering the tangible and intangible values of industrial health work it is important to briefly mention the relations of industrial physicians and private practitioners. Unfortunately, there is a tendency on the part of many private practitioners to view with alarm the growth of Industrial Medicine. Just why this should be, it is difficult to understand because experience has amply demonstrated that properly administered industrial health services advance both the professional and financial interests of doctors residing in communities where such work is carried on. Industrial physicians are, in fact, collaborators rather than competitors. They do not deal with conditions of non-industrial origin:

and with the full regard for reciprocal rights which should prevail among all ethical physicians and a better understanding by private practitioners of the functions of Industrial Medicine, harmonious and mutually helpful relations between physicians in industry and their colleagues in general practice will most certainly be established and maintained.

Since it is becoming more and more apparent that the health of the industrial worker is the hub of the wheel of industrial efficiency, it is quite natural that both employers and employees should take an increasingly greater interest in the fundamental and economic soundness of industrial medical practice. The intangible values of the work are undoubtedly much more important than those which may be estimated in terms of dollars and cents. It is obvious that increased efficiency will result from the discovery and treatment of disease, that accident prevention is better and cheaper than compensation for disability, deformity or death, and that a happy, healthy and loyal working force means greater production; but no one can hazard even an approximate guess as to just how much all these factors amount to in terms of monetary values. On the other hand, there are a number of tangible factors, such as lost time percentages for various causes, to which fairly definite financial equivalents may be assigned. Judge Elbert H. Gary, of the United States Steel Corporation, speaking before the New York Board of Trade last October, made the following statement: "During the last ten years we have expended over $100, 000,000 for welfare work alone. One might say without much thought that this is a pretty liberal expenditure of money for welfare work and that, perhaps, stockholders should have a right to say something about it and insist that the money be saved and paid out in dividends on the stock. But then along comes the thinking man, the man who has experience in this particular subject and who takes a broad view of things. He will give an answer which, to my mind, is absolutely convincing in favour of the expenditures suggested. It is this: It pays in dollars and cents, as a net result, in profits during the year, to make the most liberal expenditures in protecting the lives and persons of employees." Now, Judge Gary knows whereof he speaks and, in passing, I may add, just to mention a single item, that his organization has reduced its accidents by 62½% in the past fifteen years.

When the statement is made that industrial health work pays, it must not be assumed that the Company is the sole beneficiary. The fact is that industrial health programmes are a good investment because both employers and employees profit by them. In the ultimate analysis, the proposition may be reduced to the following simple formula: Industrial health work must be advantageous to both employer and employee if it is to succeed and economically sound if it is to last. Otherwise expressed, its permanence will depend upon its dollars and cents value and its effectiveness upon the degree of co-operative effort. The 1922 statistical and financial records of the Laurentide Health Service show a substantial monetary return to the Company and an even larger additional dividend to its employees; furthermore, taking into consideration only the more tangible values, there was a financial equivalent in service of $1.20 for every $1.00 of net expense to the Company. There is every reason to believe that Industrial Medicine is destined to fill a place of commanding influence in the existing order of society, while to the physicians in industry there is open a most unusual range of interests in behalf of national progress and human betterment.

Births during War Time.—David (Zentralbl. f. Gynäk., May 20th, 1922), from examination of children born during the war at the Universitäts-Frauenklinik in Budapest, where from 1,400 to 2,000 births take place annually, concludes that neither stillbirths nor premature births increased during the war. The proportion of male to female children did not vary from that obtaining during peace. No increased mortality among the newborn was perceptible. The average weight was found to be diminished during war time, especially during the last three years; the average dimensions also showed a decrease, which was about three per cent. in length and one per cent. in the circumference of the head. These diminutions were not traceable to a shortening of the average duration of pregnancy.

Case Reports

A CASE OF SEPTIC ARTHRITIS IN AN INFANT

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Baby H—, three weeks old was brought to the Children's Memorial Hospital suffering from a swelling in upper half of left thigh. She was a full term child who had been breast fed until the day of her admission. On the night before, the mother, when changing the child's diapers, first noticed a swelling about the left hip. The mother had never noticed that the child had been feverish, although the infant had been restless and fretful for three or four days before admission, but had slept well until the night of its admission. The mother thought the swelling was increasing in size.

On examination a large swelling in relation to the upper half of the left thigh was found. The swelling was very tense; the skin over it was of a purplish red hue and the venules appeared to be increased in number and much dilated. The tumour, tense and solid, suggested a deep seated collection of fluid although fluctuation could scarcely be elicited. The temperature of the infant was normal.

In considering the diagnosis a deep seated haematoma in one suffering from an angioma was considered to be the more probable cause of the swelling than a deep seated collection of pus due to a septic arthritis following an infection of the respiratory tract or of the navel. This diagnosis was preferred because the patient's temperature was not above normal, the skin, as already pointed out, was covered with a mesh-work of dilated venules and the onset had been sudden in a child whose surroundings were not of the best. Further, there was no indication of any infection about the umbilicus and there was no history of any naso-pharyngeal or bronchial affection. On the other hand, the incidence of this condition at the third week was very suggestive of an infective arthritis.

In order to clarify the diagnosis it was suggested that a needle should be inserted deep down into this mass. A protest was registered against this, however, by a physician who stated that if this tumour should prove to be a haematoma as had been suggested some difficulty might be experienced in stopping any haemorrhage which might result. Doubt, however, was soon removed by a sudden rise in the patient's temperature and an acceleration of pulse. This, taken in conjunction with the fact that the patient's general condition was not improving, forced the suggested exploration by means of a needle. Pus was found and a large quantity evacuated. A deep incision was then made. Through this it was found that the seat of infection was in the hip joint which was opened and a drainage tube inserted. The child lingered for a few days but then succumbed to the infection.

An arthritis due to septicaemia, of which the primary focus is in the cord or respiratory tract, generally begins about the second or third week. The joints which are most frequently affected are the knee, the ankle and the hip, although the shoulder, the elbow and the wrist may be affected. If the source of infection is in the cord the streptococcus is usually found to be the etiological factor but, if, on the other hand, the primary lesion is in the respiratory tract, no matter how mild this primary lesion may be, the organism primarily responsible for the lesion from which the patient suffers, is most frequently the pneumococcus. The prognosis in all cases is bad. The mortality is at least seventy-five per cent. This high mortality is due, not so much to the surgeon's inability to drain the joints affected, as to the fact that in the majority of these infants the process is a general infection; the arthritis is simply a manifestation of this condition Septicaemia in these young children, whose resisting power is low, causes their death in spite of all surgical procedures.

Retrospect

CONGENITAL HAEMOLYTIC JAUNDICE*

D. S. Lewis, M.D.

Montreal

Jaundice may arise in three different ways: first, from any obstruction to the outflow of bile from the biliary tract, an *obstructive jaundice*; second, from a rapid destruction of red blood cells with a consequent increased liberation of blood pigment, a *haematogenous or haemolytic jaundice*; and third, from a combination of these two processes, which is the usual condition met with in the jaundice of the acute infections.

As a general rule jaundice is merely a symptom of some underlying disease, but in certain cases no causative agent can be identified, and the disorder shows such a constant picture, that we may speak of it as a disease entity. Such a condition is met with in congenital haemolytic jaundice, which recently has been made the subject of an excellent monograph by Wilder Tileston[1].

Congenital or familial haemolytic jaundice was first described as a separate disease by Murchison, in 1885, more fully investigated by Minkowski, in 1900, but it remained for Chauffard to identify, in 1907, the two additional characteristic features, the marked increase in the number of reticulated red blood cells, and the great fragility of the red cells when exposed to haemolytic agents. In the same year Widal identified an acquired haemolytic jaundice, but the large majority of the cases are of the congenital or familial type.

In many ways the course of the disease is very like that of pernicious anaemia, another haemolytic disorder; it is one of crises followed by periods of remission, but the disease is not a fatal one, many of the cases living to the fifth or sixth decade. As a rule a crisis follows some acute infection or upset, the patient vomits much bile, the spleen enlarges and becomes tender, and there may be a great increase in the degree of the anaemia present. After a variable period there is a recession of symptoms and the patient goes on as before the crisis.

In the congenital type the family history is always of interest. Enlargement of the spleen, anaemia and low grade jaundice can usually be found in many members of the family[2], and can often be traced through three or four generations. There is no sex factor in the transmission of the disease, as is the case in haemophilia, males and females being affected in almost equal numbers.

The jaundice may be present from birth or may appear in early adult life following some acute infection, but once established it usually persists throughout life. There is no sign of obstruction of the bile passages, the stools contain greatly increased amounts of bile pigment (urobilin), while the urine is free of the usual bile pigments. Signs of cholaemia, (itchiness, bradycardia, etc.) are absent and the skin is of a lemon yellow tint, as seen in pernicious anaemia, never the bronzed colour which characterizes any long continued jaundice of obstructive origin.

The spleen is enlarged, is often tender, and during the crises it may reach the level of the umbilicus; on the other hand the liver shows only a slight increase in size.

The blood is of particular interest, as most of the clinical picture is built up around an increased destruction of the red cells. The anaemia is of moderate degree except during the crises, when the count may drop from the usual three and a half or four millions to one million or below, in a surprisingly short time. The colour index is high, as in pernicious anaemia, and the cells are irregular in size but not in shape. The characteristic feature, however, is the increased fragility of the red cells to hypotonic salt solution. In normal blood the red cells begin to haemolyse when the salt solution is diluted to 0.48—0.44 per cent., and haemolysis is complete when the dilution reaches 0.3 per cent. In haemolytic jaundice this change commences at 0.6 per cent. and is complete at 0.4 per cent., an evidence of a marked lowering of resistance on the part of the red corpuscles. The plasma plays no role in the haemolysis, because washed corpuscles show the same increased fragility. The second interesting feature becomes apparent when the blood is stained with brilliant cresyl-blue. Normally not more than one per cent. of the red cells show reticulation, while in the haemolytic jaundice ten, twenty or even fifty per cent. of the cells may show this "vital staining" reaction. This reticulation is seen only in youthful cells, and is an evidence of active regeneration, but it has been shown that these young cells are not more fragile than the older non-reticulated forms. The white cells are not disturbed in any regular way, and there is no change in the differential count. The plasma does not show any increase in haemolytic activity over that seen in normal individuals.

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*Read before the Osler Reporting Society, November, 1922.

The urine is highly coloured, due to the presence of excessive amounts of urochrome which is the normal urinary pigment. This substance is closely allied to urobilin which is also present in large quantities. The stools are never clay-coloured, indeed they often contain from ten to twenty times the normal amount of urobilin, thus giving evidence of the severity of the blood destruction.

Studies of the metabolism show a marked increase in the excretion of iron, and moderate increases in the total nitrogen and endogenous uric acid, but the metabolism of the fats is not affected. The blood cholesterin is of particular interest because of its anti-haemolytic action, but Windaus has shown that there is no lowering of cholesterol either in its free form or as cholesterin-ester. Cholesterin studies have an added interest in view of the frequency of gall stones in this disease. Mayo reports their presence in fifty-eight per cent. of his cases.

The cause of the disease is still unknown. Chauffard has suggested that in many cases the disorder is associated with congenital syphilis and with tuberculosis, but the uniform lack of curative action of salvarsan and the failure of careful study to demonstrate any syphilitic or tuberculous focus in the spleen after its removal, would seem to rule these out as causative agents. All that can be said is that it is a disease in which a diminished resistance of the red cells to haemolytic agents is an important factor, and that the spleen is a necessary link in the production of the haemolytic features of the disease, as is shown by the virtual cure which follows the removal of this organ. That a perverted function of the spleen is not the sole cause of the disorder is shown by the persistently increased fragility of the red cells which remains in a majority of cases even after splenectomy.

The pathology of the disease is of distinct interest. The spleen is markedly enlarged, due chiefly to an intense congestion of the sinuses rather than to any increase in the fibrous structures of the organ, and in this it differs entirely from the spleen in Banti's Disease. The liver is not enlarged to any proportionate extent, there are no signs of cirrhosis, but it usually shows a definite pigmentation due in part to deposits of iron in the periphery of the lobules. Siderosis is a marked feature in the kidneys, especially about the convoluted tubules. The bone marrow is red and shows signs of much activity.

The treatment of the disease is surgical; removal of the spleen is followed by a prompt recession of the jaundice, of the excessive urobilin excretion, and of the anaemia. Medical treatment is unsatisfactory.

The prognosis is good if the patient survives the operation, and in skilful hands the operative risk is not great, the Mayos reporting a series of nineteen cases with only one death. Even if untreated the disease rarely causes any serious invalidism, and many of these patients live to late middle life.

References

(1) Tileston, W., *Hemolytic Jaundice, Medicine*, Vol. 1, p. 355, Aug. 1922. (2) Barker, L. F., *Clinical Medicine*, Philadelphia, 1922, p. 160.

RETURN CASES OF SCARLET FEVER

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When a case of scarlet fever has been discharged from an isolation hospital and carries the infection home, so that other cases occur in the household, these fresh cases are known in hospital parlance as 'return cases.' The term appears misleading and inaccurate but has been widely used in medical literature for the past fifty years. Such return cases are regarded as a reproach to the hospital as being an impairment of the most important function of hospitals for contagious diseases, *i.e.*, to lessen the chance of spread of the diseases in the community. Nevertheless in the case of scarlet fever all hospitals alike seem to provide their quota of return cases. In the Alexandra Hospital, of Montreal, of 500 consecutive cases of scarlet fever discharged this year, nineteen apparently carried the infection home. The published statistics of a commission investigating the English fever hospitals showed invariably 2% to 5% of return cases. Cases quarantined in private houses show no better results. Dr. Nash, in England, investigated several hundred cases in private practice and found nearly 5% carried infection when released from quarantine.

Many different explanations have been offered of the phenomenon. The official quarantine period of the disease varies widely, from a minimum in Paris of ten days, to three weeks according to the U.S. Government, or four weeks in the Province of Quebec, or five or six weeks in various institutions. The duration of quarantine seems to have little effect on the number of return cases. Dr. Ker, of Edinburgh, watching two large institutions for a considerable period of time found that the one with the longest quarantine period had the largest proportion of return cases. For generations the desquamation was supposed to carry the infection but all the best modern authorities agree that this is a fallacy and the cast-off scales are not infectious. Most writers believe that the infection is carried by various persistent pathological discharges, and it has been suggested that patients leaving a hospital ward, easily contract catarrhal colds which provide infectious discharges.

The most probable explanation is that many scarlet fever patients remain 'carriers' of the unknown causative organism for many weeks or even months. Such carriers are recognized in almost every disease of which the specific organism is known. One need only recall diphtheria, typhoid, cholera, gonorrhoea and many others. It is noteworthy that in such carriers the persistence of the presence of the organism is due to some pathological condition, *e.g.*, chronic tonsillitis favouring the persistence of diphtheria bacilli; hence the importance of pathological discharges as favouring the continued presence of infection in convalescent scarlet fever patients. If this theory be correct we are never likely to prevent the occurrence of return cases of scarlet fever until the organism is known and can be tested for and recognized in each case before discharge.

Many suggestions have been made in recent articles on the best method of lessening the number of these return cases. The most practical ones are the following:

1st—The separation of convalescent patients from the acute cases for at least ten days before discharge.

2nd—That provision should be made for convalescents to get out of doors for several days before their discharge from the hospital.

3rd—That a stricter inspection of all patients for any pathological condition be made the day of discharge.

4th—That all discharged patients should be re-inspected after two or three days for the occurrence of pathological discharges, and if such be found, they should be quarantined again.

5th—That full instructions both written and oral be given the guardians of the discharged patients with advice to keep the patients apart from other children as long as possible.

Finally, it seems advisable to spread a knowledge of the possibility of such return cases occurring as widely as possible among physicians, nurses and the general public, to prevent causeless criticism and unearned reproach to painstaking institutions and individuals, for an occurrence which it is beyond their power to prevent, in the present state of our knowledge.

No Tampons in Incision Wounds.—Chiari explains his method of keeping open such small incisions on the fingers and hand as require it, by suturing the edges of the wound to the adjoining skin. Doubtless many surgeons have used the method, he thinks, but in the thirty cases in which he has used it the past six months the wounds have healed so well without the use of tampons that he thought it might not be superfluous to call attention to the method. To the wounds he applied ointments or sterile gauze, and hot hand baths are given, beginning the day after the incision.—*Jour. Am. Med. Assoc.*, January, 1922.

Editorial

SOCIAL INSURANCE

BOTH in England and the United States there is a well-founded belief that compulsory health insurance is contrary to the best interests of industrial workers and the people at large. Speaking of the English National Insurance Act before the Quiz Medical Society, New York, Sir Arthur Newsholme said: "On the point of equity, it must be admitted that any system of so-called insurance which, like that of the English Act, excludes a large proportion of the population who, while paying taxes in aid of the insured, require but do not receive their benefits, is contrary to the principle that any expenditure of Government funds should enure to the whole community in need of the provision in question."

Careful study of the question of compulsory health insurance brings out two rather astonishing facts: (1) that, fundamentally, the plans which are now in force are not systems of *insurance* but measures of *arbitrary taxation;* (2) that social insurance in the ultimate analysis and at best can be nothing more than a useful handmaiden to Public Health. It is not our purpose to enter into a technical discussion of the principles of social insurance but rather to present a practical working plan whereby industrial wage earners may enter into a cooperative agreement with employers and receive protection against sickness and death while economists and politicians are discussing the theoretical pros and cons of this most vital problem.

The two main subdivisions of social insurance which are to be considered are group life and group health. A study of claim figures in the United States indicates that as high as 40% of the wage earners have no life insurance and the direct and indirect relationship between illness of the bread winners and destitution requires no comment. By means of group life insurance, for which, by the way, no medical examination is required, it is possible for employees to secure protection for about half of what it would cost them as individuals in the open market; older employees who are practically uninsurable on an individual basis are taken care of and if permanent disability takes place before the age of sixty, or if death occurs at any time, there are funds available without it being necessary to "pass the hat." Group health insurance provides weekly sick benefits for any incapacity for which no compensation is payable under Workmen's Compensation legislation. Now experience has demonstrated that it is a sound economic proposition for employers and employees to combine forces in connection with these matters—in fact, it is doubtful if there are many ways in which they can cooperate to greater mutual advantage.

During 1922 a well known Canadian industrial organization carried on such a plan and the following figures are taken from the annual report:

Total amount of life insurance under the group contract, $2,056,788.70,
Number of individual policies, 1,083,
Total amount of sick benefits paid, $9,447.26,
Total payments for death and permanent disability claims, $21,048.00.

The premiums and overhead charges amounted to only $36,370.58 and were shared by both employer and employees. Among the employees there were more than 125 who could not have purchased life insurance at any price as they were uninsurable on an individual basis, and this cooperative group insurance plan produced, not only in these instances but also among the working force generally, a reaction which was translated into terms of greater loyalty, greater contentment, greater cooperation, greater production; and less absenteeism, less labour turnover and less operating expense.

When one reads the innumerable articles that have been written about social insurance and then considers the practical simplicity of the cooperative effort herein outlined, there comes to mind that excellent work of Herbert Spencer on quite another subject: "The Murder of a Beautiful Theory by a Gang of Brutal Facts."

B. L. WYATT

ABILITY IN CHILDREN

IN the *British Medical Journal*, February 25th, 1922 the work of Mr. Cyril Burt, psychologist for the schools under the jurisdiction of the London County Council, is discussed. When intelligence tests are being so frequently used in all branches of society to-day and are being discussed by everyone, it is well to see such an article in a medical journal pointing out the weaknesses of such tests. Not that these tests are absolutely condemned but it is pointed out that perhaps there has been a too liberal translation of the tests from the French originals. In this respect Mr. Burt has evidently not been using the Terman revision of the Binet-Simon tests as in this revision this objection has been removed. "The school examination is a fair test of knowledge of school work, but it is a poor measure of capacity, and ignorance of school learning is no proof of defect. The argument, that where attainments are meagre ability must be low, is fallacious. Poor health, poor homes, irregular attendance at school, lack of interest in the subjects of instruction, want of will to learn them, are commoner causes of inability to spell or to calculate than an inherent weakness of intellect or genuine defect of mind. The dull are usually backward, but the backward are not necessarily dull." All this is perfectly true but to many is not known. It has taken the results of school surveys using the intelligence tests to make educationalists really appreciate this fact. In his survey Mr. Burt found some 1.5 per cent. of the school population of London mentally defective. In America the results have been from two to three per cent. In analysing the 1.5 per cent. Mr. Burt found that only one-third of them, or 0.5 per cent. of the grand total of children are so defective as to warrant their being classed as "institutional" cases; one-third will need "supervision," and the other third are only to be reckoned defective owing to the defects of our educational system. These facts could all be applied to any section of Canada. When a child is diagnosed as being mentally deficient it does not mean that he must be placed in an institution. Many mentally deficient children are more trainable than many children with normal intelligence. It is necessary, however, to change our system of education for these children. They cannot be educated in the haphazard manner in which our normal children are being educated. Special classes are needed for them; in these classes these children are taught according to their capabilities. The results obtained by these special classes have been most encouraging. Fifty to seventy-five per cent. of the children graduating from these classes become self-supporting. As regards the intelligence tests themselves it must be clearly understood that the results from these tests are not to be considered the final diagnosis. These tests are not the final word in deciding the cause of a child's backwardness in school. Many factors have to be considered before a child is diagnosed as being mentally deficient. A careful family and social history, a medical and psychiatric examination as well as a psychological examination should be made of each child. The internist does not rely absolutely on a Wassermann report to decide whether a patient has syphilis or not. Neither can a child be pronounced to be mentally deficient simply on the result of an intelligence test. These tests are simply an aid, a valuable aid, in determining a person's intelligence.

TETANY

THE occurrence of tetany in diverse conditions has long been a puzzle to physiologist and clinician alike. To mention only a few of these; it is seen in infancy, in patients who have had an accidental removal of the parathyroid glands; following the administration of large doses of bicarbonate of soda, in patients with pyloric obstruction; and occasionally following prolonged deep breathing in patients with functional nervous disorders. At first glance it appears impossible to find a common basis for the etiology of this phenomenon in the above-mentioned conditions. A large amount of experimental and clinical work has recently been done with this end in view.

It seems a well established fact that infantile tetany and the tetany following parathyroidectomy depend upon a disturbance of calcium metabolism either primary or secondary. One manifestation of this is the reduction in the calcium concentration of the blood which is found in these types. Probably the body fluids share in this reduction. In both these types the tetany may be relieved by the administration of certain calcium salts. As it is known that the irritability of nerve and muscle tissue is dependent upon a definite ratio between the calcium and sodium salts in the fluids bathing them, it is likely the reduction in the sedative calcium element which causes the tetanic contractions. Paton and his school have attempted to show that "parathyroid" tetany results from an accumulation of certain toxic substances of the purin group, which they claim are normally neutralized by the parathyroid glands. If this be true it is possible that the disturbance in calcium metabolism is secondary to this.

In the tetany following pyloric obstruction there is a definite increase in the alkaline reserve of the blood as measured by the blood bicarbonate (Van Slyke). Following the administration of large doses of soda, especially in patients with impaired renal function, the same increase of the alkaline reserve takes place. In both these groups the calcium content of the blood remains normal. It appears then that tetany may occur in certain cases where the alkaline reserve is increased above a certain level. This gives a warning against the administration of excessive amounts of sodium bicarbonate, which is often administered indiscriminately for the treatment of acidosis. Examination of the urine and where possible, of the blood will guard against such accidents. Both these types of "bicarbonate" tetany may be relieved by the administration of acids such as hydrochloric acid or of other substances which reduce the alkaline reserve of the blood, like ammonium chloride and calcium chloride.

Another peculiar form of tetany has been observed experimentally and clinically following prolonged deep breathing. Grant and Goldman have shown that in this condition a true or uncompensated alkalosis takes place. The calcium metabolism as measured by the calcium content of the blood seems to be normal.

Freudenburg and Gyorgy have advanced the ingenious theory that in "bicarbonate" tetany and the tetany occurring with alkalosis it is a decrease in the ionized or physiologically active calcium of the blood which determines the onset of the tetanic symptoms. If confirmed this will explain these types of tetany on the basis of a disturbed calcium metabolism. The proof of this will rest finally upon the actual measurement of the ionized calcium of the blood. The methods used for this determination are still imperfect.

LEAD POISONING

AMONG industrial diseases, lead poisoning is one which not only in recent times but in past ages has demanded persistent attention. Until the end of the last century more attention was paid to the treatment of those affected than to the prevention of the ailment. A more recent enquiry into the dangers attendant on the use of paints, lead compounds, etc., has been held by the New South Wales Board of Trade at the instigation of the Minister for Labour and Industry. The report of the Board recently issued is an elaborate document of nearly 800 pages. Among the witnesses who were called before this board were medical practitioners, mining engineers, master painters, and operatives. The conclusion the Board came to was that lead, as used in the painting industry, that is, chiefly as white lead, is a substantial cause of injury and death to painters and other workmen engaged in the painting industry, but that immediate prohibition is not the appropriate remedy for these evils. In the opinion of the Board there is no more reason for the prohibition of the use of white lead in paints than there would be for the prohibition of lead mining or of the mining of other metals found in geological association with lead-containing minerals. "Lead poisoning" being a preventable disease, it would indeed be a desperate situation if the only means of prevention were the abolition of the use of lead. Special stress is laid on the importance of attention to personal hygiene, to a properly arranged dietary, and to the avoidance of intemperance. Employers should be compelled to provide efficient ventilation of factories, and to install suitable washing appliances and supply proper medical supervision.

SEPTIC THROMBOSIS: ITS DIAGNOSIS AND TREATMENT

AT this season of the year, and with the presence in almost every community of catarrhal colds of all degrees of severity the paper read at the last meeting of the British Medical Association on Septic Thrombosis, by Sir William Milligan, *British Medical Journal, September*, 1922, has a very special interest.

Sir William Milligan at the outset emphasizes the fact that the presence of a thrombus in the lateral sinus is in effect an effort on the part of nature to protect deeper seated and more vulnerable structures. The ever varying position of the sinus to adjacent mastoid cells is of more importance in the incidence of disease, than the virulence of the casual organism, which is usually a streptococcus; most frequently the *streptococcus haemolyticus*.

Thrombosis of the mastoid is more likely to occur in the pneumatic than in the diploetic variety of mastoid. The diagnosis in typical and advanced cases is not difficult. It is in the atypical and latent cases, both by no means uncommon, which present the greatest diagnostic difficulties, and it is in these very cases that an early and accurate diagnosis is most vital. These latter are most frequently met with in children, where no demonstrable symptoms of mastoid infection may be present. An intelligent appreciation and anticipation of the course of pathological events will assist in making an early diagnosis.

Sir William Milligan finds that in his series of intracranial complications secondary to purulent otitis media, thrombosis of the lateral sinus occurs in 50% of cases, while septic meningitis occurs in nearly 60% of cases; both complications tend to be solitary complications. The former is generally amenable to early surgical interference; the latter is almost invariably fatal. The author points out that although septic thrombosis is in the vast majority of cases a disease of neglect and the result of a chronic suppurating otitis media and mastoiditis, it not infrequently follows an acute attack. The involvement of the sinus by direct extension (periphlebitic origin) is more gradual in onset, being limited by a barrier of granulation tissue; it is also more likely to perforate with abscess formation in continuity with the area of suppuration within the mastoid cells. Haematogenous infection (endophlebitic origin) produces few local changes for a considerable time, but gives rise to symptoms more rapidly, and is the more dangerous type.

Of the symptoms, the occurrence of a rigor in any case of middle ear suppuration, is a danger signal of the first importance. The temperature record being one of the most important and reliable diagnostic signs. The swinging morning and evening temperature indicates that thrombosis is in full bloom. In the atypical cases the temperature is a less exact guide, the tendency being for it to be continuously high, rather than remittent. The pulse varies more or less regularly with the temperature. Rigors occur in about one half the cases only, being frequently absent in children, while chills and a feeling of chilliness are present in nearly 80% of the cases.

The author also points out that slight ocular changes occur in 75% of sinus cases. An actual optic neuritis occurring in 30% of the cases. The x-ray offers no assistance in the diagnosis of a thrombus; and blood tests are of little diagnostic value. A leucocytosis is suggestive of pus but not necessarily pus in the sinus or even around it.

In his experience the disease with which sinus thrombosis is most likely to be mistaken, is typhoid fever, simulating this condition very much during the first week. The presence of a Widal and petechiae, the absence of very marked variations in temperature with rigors or chills is, as a rule, sufficient to differentiate. A central broncho pneumonia is differentiated by the persistent cough, rusty sputum and more even temperature. A blood examination helps to distinguish it from malaria.

He states that the value of an early and accurate diagnosis cannot be overestimated and that when reasonable doubt exists, he has no hesitation in performing an exploratory operation, in exposing or actually slitting up the sinus, purely and solely for diagnostic purposes. He has never had any reason to regret having adopted this course of action.

D. H. Ballon

Acidosis in Hyperthyroidism.—Ralph H. Major, Kansas City, Kan., reports two cases of marked acidosis associated with hyperthyroidism of moderate severity, the condition appearing in one instance after roentgen-ray treatment of the gland, and, in the other, following a lobectomy performed under nitrous oxide and oxygen anaesthesia. Both patients responded promptly to the administration of alkali.—*Jour. Am. Med. Assoc.*

Editorial Comment

It has been brought to our attention by the Secretary of the British Columbia Medical Association that negotiations between the Industrial Service Committee of that Association, and the Canadian Pacific Railway Employees Medical Association have reached an *impasse.*

These negotiations have been pending since January,1922, and the subject at issue is the terms of contract between the Canadian Pacific Railway employees organization and its medical officers.

We have invited the British Columbia Medical Association to prepare a succinct statement for insertion in the correspondence columns of the March issue of the *Journal.*

In the meantime we would strongly advise any medical man who contemplates engaging with the Employees Association in response to recently issued advertisements to thoroughly acquaint himself with the situation before coming to a conclusion.

LETCHWORTH VILLAGE—A MODEL INSTITUTION FOR THE CARE OF DEFECTIVES

This institution is intended eventually to provide for about two thousand persons. It is beautifully situated on the shores of the Hudson River. At Letchworth Village the estate comprises about twenty-one hundred acres, much of which is just as nature made it; the buildings are in small units accommodating, with their dormitories about eighty patients. The buildings themselves are of field stone roughly dressed and made most attractive in appearance; the dormitories are all of one story in height, and are of semi-fire proof construction. They are perfectly ventilated, kept very cleanly and are ideal from every standpoint. An air of happiness is everywhere prevalent. The dormitories and buildings generally are flooded with sunlight, and although the construction is plain and devoid of unnecessary architectural adornment, yet the result is most pleasing.

There are at present about fifteen hundred inmates under institutional care. Everyone is enthusiastic over their work, and the industries are so numerous that every patient can find an outlet for his energies and have the best of his abilities developed.

A great feature is made of the playgrounds and entertainments generally, and during my visit most of the children we found occupied in manufacturing the things necessary to celebrate their Christmas in as happy a way as possible. Their gymnasium work was surprisingly good, and eve boxing bouts were going on. The intention is eventually when the building is completed to have a segregation of the sexes, and that is done as far as possible at the present time.

Dr. Little is strongly of the opinion that the boys who have been instructed in different vocations are much better afterwards if they receive a year or two of instruction on the farm or in the garden where they learn habits of patient industry and discipline that are simply invaluable to them when they leave the institution.

The great majority of the patients are of the higher grades, although a few idiots and low grade imbeciles are received. No less than one hundred patients are on parole at the present time, and a certain number of them always succeed in winning their way into communities where they can be of some use. Of course, this requires the development of a carefully detailed follow up system.

The question of research is not being overlooked, and although the medical staff is smaller than it might be, yet some interesting research work is being carried on by Dr. Potter, who is an unusually bright assistant. He is making a careful investigation of the endocrine imbalance and personality, and has already issued some interesting literature.

Letchworth may be taken as a model in the development of proposed schools for mental defectives in connection with the Department of Public Health, in Toronto, and in the various provinces of Canada. A striking point is that the majority of the teachers are young and enthusiastic, and have imbued their pupils with the same optimism that pervades themselves.

C. K. Clarke

HANDBOOK OF CHILD WELFARE IN CANADA

Marked interest has been shown in this Handbook, which is to be published shortly by the Department of Health of Canada. There are in each province, six or seven different members of the Government under whose direction work for child welfare, in the modern acceptation of that term, is carried on, and it is from the official reports of these Ministers, and with their co-operation and assistance, that the handbook has been compiled and edited by Dr. Helen MacMurchy, Chief of the Division of Child Welfare in the Department of Health.

It goes without saying that the two chief leaders in work for child welfare are the Minister of Education and the Minister of Health. In addition, juvenile courts are under the charge of the Attorney General; orphanages, industrial schools and other institutions for children are usually in the Provincial Secretary's Department; and the Women's Institutes or Home Makers' Clubs or Cercles des Fermieres which are a subdepartment or extension department of the Department of Agriculture, are also doing a great deal of work for child welfare. Mothers' Pensions are administered under the direction of the Provincial Secretary or the Provincial Treasurer or by the Workmen's Compensation Board: the Minister of Labour also directs certain efforts for child welfare.

It is intended that the Handbook will give a general view of all this work, and so will be valuable as a book of reference. It will be possible to ascertain, by consulting it, not only what work is being carried on for child welfare in Canada, but also how, by whom, and under what government direction this work is done. There will also be information about voluntary societies which have for their object the furtherance of child welfare.

A table giving the birthrate, infant mortality, and maternal mortality for all Canada compiled by the Dominion Bureau of Statistics will also appear in the Handbook. As this is the first time that these figures have ever been available, this table will increase the value of the Handbook for purposes of reference.

Renal Colic in Cases of Renal and Ureteral Stone.—Of the thirty-two patients admitted to the hospital for renal or ureteral calculus whose cases are analyzed by Henry H. Morton, J. Sturdivant Reed, John H. Burke and William B. Tatum, Brooklyn, thirty stated that they had come for the relief of pain. Twenty-seven described their pain as paroxysmal in character, starting over one kidney and radiating along the course of the ureter or remaining localized in the kidney region. Of the others, one complained of dull pain in the lumbar region; one had abdominal pain, first diagnosed as an acute condition of the abdomen; another patient sought relief for backache, which had been diagnosed as due to spondylitis. Two of the patients who later proved to have calculi had had no pain or colic that they could recall, and were sent to the hospital for the relief of other symptoms, viz., pyuria. The duration of colic in this series presented a wide variation: in one case there had been an attack three days before admission and none before, while two of the patients had had repeated attacks for twelve years. The remaining patients had had attacks extending over three or four years before admission; this was found to be a fair average of the duration of colic. The authors urge that an early and complete urologic and roentgenologic examination should be made in every instance in which stone is suspected. Early operative intervention is indicated as a measure of prevention against destruction of the kidney. Stone in the kidney, if allowed to remain, eventually results in total destruction of the organ. Small calculi should be observed for a reasonable time before operative removal is attempted. Many of them will pass spontaneously or can be assisted by repeated dilation of the ureter.—*Jour. Am. Med. Assoc.*, November 11, 1922.

Men and Books

MEDICINE IN THE CENTURY BEFORE HARVEY

In the last Harveian oration, Mr. Arnold Chaplin, librarian of the Royal College of Physicians, of London, has given us an interesting account of medicine in the centuries before Harvey. At the beginning of his lecture he referred to the great precision with which Harvey indicated his aims in founding this oration, which he was very desirous should serve as a stimulus to keep alive in the minds of its members and Fellows the importance of searching and studying out the secrets of nature by experiment, and also of maintaining the honour of the profession by the promotion of mutual love and affection. When Harvey, in 1656, attached to his bequest these two fundamental commands, the peculiar condition of scientific and political thought rendered both equally important. Until the dawn of the sixteenth century it might be asserted that the study of medicine had made little advance in Europe, since the Greek period which closed with the age of Galen. But with the revival of learning towards the end of the fifteenth century came a far reaching change in the attitude of students towards the study of medicine and of science. Hitherto they had been content to accept all that had been sanctioned by authority Few had been competent to determine whether the texts they read were exact translations from the original authors or merely corrupt compilations. Owing partly to manuscripts brought back by the Crusaders, and more abundantly to the unlocking of the literary treasures of Constantinople when Mahomet burst through its gates and took possession, a dissemination of Greek learning was taking place throughout Europe. Greek scholars fleeing from the Turks took up their abode in Italy. Ships coming from the Golden Horn carried priceless manuscripts which their victorious enemy, caring nothing for the learning of the Infidel, had spurned. Italy welcomed the scholar refugees, and the Italian universities were soon busily engaged in the study of the new folios. Learning revived, and with it medicine and science began to be studied in a manner calculated to produce solid and lasting results. Students flocked to Italy from every part of Europe, but of all those who made a pilgrimage to the shrines of the new learning the great figure of Thomas Linacre, the founder of this College, possesses for us an absorbing interest. Already proficient in the Greek language, in Italy he placed himself under the best classical teachers of the time, and while engaged in the study of the old Latin masters he became interested in medical writings, and after a residence at Padua he graduated at its University. The writings of Galen appeared to have already strongly attracted him for in after years he confined his attention chiefly to that author and devoted his unrivalled scholarship to the purpose of providing correct and elegant Latin translations of the more important of his works. To Linacre, however, belongs a greater honour than any he obtained as a scholarly translator, for impressed with the facilities afforded in various universities throughout Europe and especially in Padua he founded the College of Physicians of London, the first institution devoted to the advance and conservation of medical science in Great Britain. Padua, then nearing the zenith of its fame and activity had had a profound influence upon his mind. He had felt in this city the first pulsations of intellectual life and its strivings to pierce into the unknown. The care at that time bestowed on the study of medicine by the universities and by the state in Italy deeply impressed him, and when in after years he resolved to improve the condition of physic in his own country, it was after the Italian model that he shaped this college. We in looking back through more than three centuries of turmoil in politics but nevertheless great advance in knowledge, recognize gratefully the characteristics strongly impressed on our college by its founder; those of high purpose and of catholicity of spirit. Toward the end of Linacre's life he designed a further scheme for promoting the study of medicine in the sister universities, and although its practical application fell far short of the intention of its founder, the credit belongs to Linacre of the attempt to improve the facilities for the study of medicine in the universities of Oxford and Cambridge. In these later days, the funds of the Linacre lectureships at Oxford are now devoted to the teaching of physiology, while at Cambridge, his own College of Physicians has been entrusted with the duty of promoting the study of anatomy so earnestly desired by the founder.

John Caius, like Linacre, was a scholar. He had trodden the same paths in Italy in his quest for learning, and afterwards spent his life in promoting the cause of science and medicine. Although a type of the scholar-physician he was the first in England to write a treatise on clinical medicine. Natural history also claimed his attention, and he was also one of the first to write on that subject. In common with Linacre, Caius was strongly attracted to the writings of Galen, and spent much of his time when in Italy in carefully examining the manuscripts of that author. But he was not cast in such a rigid mould as Linacre, and there is evidence in his writings that his mind was undergoing the emancipation inevitable with the ever-widening scope of scientific knowledge taking place in his day. When in Italy he lodged with Vesalius and acquired from him a taste for anatomy, and on his return lectured on anatomy before the barber-surgeons, and may thus be regarded as an early promoter of the study of anatomy in Great Britain.

These scholar-physicians of whom Linacre and Caius were shining examples, in spite of their limitations occupied no inglorious position in the history of medical and scientific advance. They restored to the profession the writings of the old masters in a pure text; and they were deeply imbued with a strong desire to benefit mankind by advancing knowledge. Linacre's desire took form in the foundation of this College of Physicians and John Caius in the college bearing his name in Cambridge. A. D. B

The Course of Mortality From Cancer in Baltimore.—To obtain a good understanding of the survey made by William Travis Howard, Jr., Baltimore, the original paper should be consulted. In closing, he says: If it were practicable to investigate the course of cancer mortality for each particular organ or part, even if no more thoroughly than it has here been possible to do for cancer of the breast and uterus, it would be found that cancer is not increasing in either incidence or in mortality among those actually exposed to risk. So far as Baltimore is concerned, the evidence at hand is insufficient to prove conclusively that there has been no actual increase in the mortality rates from cancer of all organs taken together, at least it renders this doubtful. It does show beyond all question of doubt that cancer mortality in Baltimore has not increased in any degree approaching that indicated by the crude rates. For cancer of the only two organs, the breast and the uterus, for which rates approaching specificity could be obtained, it has been shown that in the forty years ending in 1920, mortality has not increased, and that during the latter half of this period there has occurred a gradual but very significant decline in the death rate, which, in the absence of other satisfactory explanation, it seems safe to ascribe to medical activities.—*Jour. Am. Med. Assoc.*, January 13, 1923.

Essential Haematuria.—According to C. P Van Nes, in addition to the ordinary causes of renal haemorrhage (such as tuberculosis, stone or tumour, and acute nephritis), general or local renal congestion (so-called renal varix) may be responsible for haematuria. Chronic nephritis or acute glomerulo-nephritis may be the cause of the bleeding. Haemorrhage from the kidney without any anatomical lesion, or so-called essential haematuria, if it occurs at all, is very rare. The diagnosis of haemorrhage from a healthy kidney can even be made clinically, but is only possible after careful naked-eye and microscopical examination of the kidney in question. Unilateral haemorrhagic nephritis has been repeatedly observed, although the absolute proof, consisting of comparative examination of both kidneys, is still wanting. Nephrectomy in these cases is only indicated in the event of dangerous haemorrhage. Nephrotomy or removal of portion of the kidney for examination is, according to the literature, a good operation, since it is only by this means that other causes can be excluded, and the operation may have a favourable effect upon the haemorrhage. *B. M. Jour.*, December 16th, 1922.

Correspondence

THE TREATMENT OF GOITRE

The Editor, The Canadian Medical Association Journal, Montreal.

Dear Sir:

In the December number of your joural you published three articles on goitre which I am sure were of the greatest interest to your readers. The contributors dealt very fully with surgical treatment, but they seem to have been unaware of the progress that has been made in x-ray and radium-therapy in hyperthyroidism. All three writers were of the opinion that radium would not produce a permanent cure. There is at the present time a large field of literature, covering histories of hundreds of cases, which is quite sufficient to convince an impartial observer that there are, relatively, as many cures by radium as there are by surgery. From this literature I shall cite a few extracts in order to show what has been done in the sphere of radiumtherapy.

Burrows and Morrison (*Proc. Roy. Soc.*, 1920) state: "In 100 consecutive cases treated with radium 'perfect' results were obtained in twenty and 'good functional' results in twenty. In forty cases the condition was improved. Twenty patients gave up treatments and were not benefitted."

The London Radium Institute report for 1920 states: "Prolonged irradiation with the gamma rays will often prove of great use when routine medical treatment has failed......The treatment is sometimes followed by a definite exacerbation of all the symptoms, and it seems fair to attribute this to an increased outflow of the thyroid secretion into the blood stream. Such exacerbation, however, proves transient, and is usually followed by a gradual but steady and definite improvement in the patient's symptoms and general condition, and this may probably, almost certainly, be ascribed to the action of the rays bringing about an arrest of the vitality and retardation in the development of the actively proliferating cells, thus restoring the output of the cellular secretion more nearly to normal limits. With this there is also associated a fibrosis of the connective tissue of the gland, causing the organ to become firmer and smaller."

The Manchester and District Radium Institute in 1921, reports 180 cases treated, fifty-two of which were recorded as cured,—all symptoms and signs of disease having disappeared, except sometimes slight exophthalmos, for over two years, only one recurrence being recorded.

Clagett (*Ill. Med. Jour.*, 1920), reports forty-seven cases treated with radium, six of whom were recurrences after operation. In all cases he obtained decrease in pulse rate from twenty to fifty beats, disappearance of nervous symptoms and tremours and gain in weight, but the exophthalmos tended to persist.

Quigley (*Med. Herald*, Sept., 1921), states that the results in Graves' disease with radium are so prompt and decisive that there can be no doubt as to the beneficial effects. He considers that no patient with simple or toxic goitre should be submitted to operation without first being given the benefit of radium treatment.

In a paper on "Radiation and Thyroid Disease" (*Jour. Rad.*, July, 1921), Soiland states: "It is not the intention of the writer to decry surgery, or to detract one iota from the many brilliant results obtained by competent operators, but the fact must not be lost sight of that in radiation we have a proved therapeutic agent, far superior to any other given us up to the present time."

Loucks, in a paper on the use of radium in this condition, states (1922): " 'The physiological findings after radium treatment' could be reported *en masse* by stating that there was a general return to the normal of all pathological manifestations. The merits of radium treatment are strikingly shown in the number of our cases where the metabolic rate was taken before treatment and every three months after. Some were normal in three months, others nine months after treatment."

We have been treating this condition at the Radium Institute, Toronto, for twelve years. In the early part of this period the type of case which was suitable for radium treatment was not established, and radium was often used with little success, but from this long experience we now feel confident in stating that in toxic adenoma, toxic goitre, hyperthyroidism, exophthalmic goitre, Graves' disease, or whatever nomenclature may be used to designate this condition, radiumtherapy has shown its unique value in treatment. We have had at least 150 cases which corroborate singularly well the views above expressed, all of which views are the result of years of intensive study of this condition.

There is another point which none of the writers to your journal have considered, namely, the application of radium to cases of toxic or exophthalmic goitre that are bad surgical risks. In these particular cases the application of radium has perhaps its best field, for the patient may be brought back again to a condition in which operative procedure may, if necessary, be safely undertaken. The experience of all those who have written on the subject seems to be that radium is a very valuable adjunct to the surgeon at all times and that it can of itself secure a permanent cure in a considerable number of cases of toxic and exophthalmic goitre.

Yours very truly,
W. H. B. Aikins.

The Radium Institute of Toronto,
January 16th, 1923.

CURE FOR SEA-SICKNESS

It affords me great pleasure to have the privilege of setting forth my experience regarding the "Cure for Sea-Sickness."

In order to strengthen my claims I travelled steerage, thus receiving the full sway of the ship. It was on board the "S.S.Canada" in June, 1919, that I made the experiment. I observed that nearly all cases of this malady occurred at the meal table. When one passenger showed signs of vomiting, several others immediately became affected. The first thing I did before eating, was to sit in a slightly stooped position causing a compression of the abdomen and preventing an internal movement with the sway of the ship. It was this simple discovery which enabled me to partake of every meal with not a trace of sickness notwithstanding the fact that I was in poor health owing to overseas service and that on two previous trips I suffered the ill-effects occasioned by sea-sickness. I noticed that after two days practice of this method I gradually became accustomed to the sway of the boat and gradually resumed my natural position. After each meal I took a brisk walk and on no occasion whatever would I lie down in my bunk till bed-time. I also noticed that when passing through the corridor between the cook-houses and engine room, a sickening odor was emitted from the vapour of the oils in the engine room and their mixing from the vapours from the cook-housees. To one not accustomed to these odors, vomiting was the result. I always closed my nostrils when passing this particular spot, also avoided smoky and overheated rooms. To keep the bowels in regular condition, I ate oranges, apples and peppermint drops, but even without these, I attribute my success to slight compression of the abdomen by sitting in a stooped position and staying at the table for a few minutes after each meal.

Many people would only be too glad to take trips across the ocean if it were not for their dread of sea-sickness.

My cure would benefit humanity, steamship lines, prevent filthy decks and unpleasant odors from vomiting and create more travel on a general scale.

Ottawa, Dec. 28th, 1922. Alexander Factor

Abstracts from Current Literature

MEDICINE

Etiology of Rickets. Mellanby, Edward, M.D. *B.M.J.*, November 4, 1922.

Rickets is a disease accompanying growth and is due primarily to defective feeding. Assuming that the diet contains a sufficiency of calcium and phosphorus in a form that can be absorbed, the most potent influence for procuring the proper calcification of bone is a vitamin of the fat soluble A. class.

There is no difficulty in producing rickets in dogs by feeding a diet containing abundant calcium and phosphorus but deficient in fat-soluble A. If either of these salts is deficient, a condition of osteoporosis results, but the development of rickets will depend on the rest of the diet. A certain rate of growth is also essential for the production of rickets, which does not occur in conditions of arrested or retarded growth—such as marasmus.

A child may develop rickets on a poor diet in calcium—but often such a diet will also be deficient in fat-soluble vitamin for these substances are often closely associated in natural foodstuffs, such as milk, egg yolk and green vegetables, whereas flour, rice, potatoes and sugar are almost devoid of both.

A deficiency in phosphorus may be even more important especially if the vitamin is also deficient. Skim milk powder may be used to cure rickets if given in sufficient quantity and with little cereal, probably on account of its high phosphorus content and because it is not entirely devoid of fat-soluble vitamin, but the presence of abundant cereal will tend to aggravate the rachitic process.

Whereas the fat-soluble vitamin working in conjunction with calcium and phosphorus ensures the calcification of bone, other elements in the diet have an influence in promoting the laying down of new bony basis without at the same time ensuring its calcification. The worst offenders in this respect are cereals and carbohydrates. Oatmeal in particular has a greater rickets producing effect than either flour or rice, in spite of having about five times more P_2 O_5 than either of the others. Nor does this effect appear to be due to its carbohydrate moiety, for oatmeal has a much lower percentage of carbohydrate than either rice or flour.

The explanation seems to be in the power cereals have of stimulating growth—not only in laying down fat and tissues generally but in producing longer and bigger bones. This makes a greater demand on the calcification process, and if any of the factors essential to sound bone formation are relatively defective, rickets will result. For example: increasing the bread in a diet slightly rickets-producing emphasizes the disease and produces larger quantities of cartilage and osteoid tissue in the bones.

There is no doubt that sunlight possesses an anti-rachitic power—due to its ultra-violet rays. Even tetany, latent or manifest can be cured by ultra-violet rays. Possibly the fat soluble vitamin is liberated into the circulation by the action of such rays upon the skin. This action does not occur when light passes through window glass.

If a diet is well balanced, sunlight will have no definite effect in this regard, but if the diet is deficient, sunlight will tend to inhibit or ameliorate the development of rickets.

Mellanby recommends the following diet for rachitic children:

Milk 1-1½ pints.
Beef drippings 1-2 ounce with bread,
Meat 1-2 ounces mixed with potatoes.
One egg—One orange.
Milk pudding,

This diet alone will bring about rapid improvement but the process of healing is hastened by the addition of cod liver oil. Clinical improvement with calcification and growth of bone are obvious within a few weeks even without sunlight, exercise or massage. L. M. Lindsay

The Etiology of Rickets. Findlay, Leonard. *B..M.J*, November 4, 1922.

Investigations into the cause of rickets have been directed along three lines: prophylactic, provocative and curative.

Hess was probably the first to demonstrate that cod liver oil (fat soluble—A.) possessed a marked prophylactic power. The negro infant in New York almost invariably suffered from rickets; yet Hess and Unger by simply administering cod liver oil were able to prevent this in the majority of cases treated.

While the dietetic theory of the causation of rickets is the most popular at present, the work of Pirquet in Vienna argues against a fat deficiency theory. Fat was almost eliminated from the diet of infants in Vienna during the war, the required number of calories being supplied by carbohydrates. No ill effects were observed from such a diet either in regard to general nutrition or to osseous development.

In India, Hutchison found two classes of society living under totally different circumstances: One was composed of poor labourers and agriculturists, living an open air life. The other, a wealthy class, whose women and children were almost continuously confined to dark, airless apartments. The infants of both classes were breast fed a year or more. The diet of the poorer class was almost devoid of fat, especially animal fat; whereas that of the wealthy mothers contained fat in moderate amounts, as well as milk, eggs and vegetables, which are said to contain the antirachitic vitamin. Yet it was amongst this wealthy class that rickets was most prevalent and the poor class was almost immune. In both classes dental caries was exceedingly rare.

Therapeutic tests were carried out in a London poly-clinic. Here Dr. MacKay was quite unsuccessful in curing active rickets by fats of various kinds. Even large doses of cod liver oil and butter failed to show any beneficial effect.

Keratomalacia is very prevalent in Japan where the diet is notoriously deficient in fat, yet rickets is almost unknown. The converse holds good in Glasgow.

In active rickets fat absorption is as good as in health yet calcium is imperfectly retained, and inorganic phosphorus in the blood is below par.

A certain rate of growth is essential for the development of rickets as it does not occur in marasmus or in coeliac disease. There must be, therefore, some lesion which allows the absorption of elements necessary for growth and at the same time deprives the organism of some other element necessary to regulate this growth.

Findlay is convinced that the development of rickets depends on over-crowding, poor care, lack of fresh air and exercise. The effect of confinement may be due to one of two factors; either deficient exercise or lack of sunlight. The former, he holds is more important than the latter for better results were obtained by keeping rachitic children in Glasgow and carrying out massage than by sending them to the country where sunshine was more plentiful. Rickets is "completely absent" from Iceland where the sun never shines for four months of the year.

Sunlight undoubtedly has a curative effect on rickets. Whether it acts by stimulating metabolism or by virtue of its antimicrobic power is not definitely determined. Sunlight usually means fresh air, ventilation, and diffusion of infection. In fact it would appear that only by enlisting the aid of some virus can one explain not only the geographical and social distribution, but also the seasonal and age incidence of rickets.

In the discussion, Dr. Robert Hutchison (London) stated that few clinicians would agree with Dr. Findlay if he maintained that rickets was a microbic disease.

Rickets has none of the usual characters of such a disease, but suggests a purely metabolic disorder like gout or diabetes. It is quite likely that many factors, dietetic, hygienic, etc., may be able to bring about the general disorder of metabolism called rickets. L. M. LINDSAY

The Heart Action in Spasmophilia. Koplik, M.D. *Trans. Amer. Pediatric Society*, 1922.

Under the term spasmophilia, Koplik includes laryngeal stridor, convulsions, carpo-pedal spasm and attacks of apnoea. Any of these conditions may be either latent or manifest; all are characterized by increased irritability of the peripheral nerves to galvanic current. In the characteristic reaction, the KOC, AOC, and ACC, all occur with a current of less than 5 milliamperes and usually less than 2.5.

Koplik has learned to fear sudden death with attacks of apnoea which may occur apart from any other manifestation of spasmophilia. Escherich was the first to suggest that paralysis of the heart might be the cause of the sudden death. Koplik observed that at the onset of an apnoeic attack the heart suddenly slowed down to one-half or even one-third of the previous rate, then as the attack subsides and the infant begins to breathe again, the heart beats faster and soon attains the normal. During the slowing down stage, the heart is quite regular, but there is a double beat at regular slow intervals. This slowing of the heart is just as characteristic and pathognomonic of spasmophilia as the electrical hyperirritability.

Chvostek's sign is frequently absent in these cases, while an attempt to elicit Trousseau's sign may precipitate a spasm of the larynx or general convulsion and so is not justified. The cause of the slowing of the heart may be due to an increased irritability of the vegetative nervous system or of the pneumogastric nerve. In all his cases, the x-ray showed enlargement of the thymus gland, so that the sudden death may be associated with so-called status thymo-lymphaticus, yet Koplik does not think the thymus is the essential influence in producing spasmophilia, but believes the parathyroids will be found to be the chief offender. L. M. Lindsay

Comparative Prognosis in Tuberculous Lesions of the Right and Left Lung. A study of 1,048 cases. Stivelman, B. P., and Miller, N. C. *Am. Jour. Med. Sc.*, July, 1922.

Brown has stated that there is no difference in the gravity of lesions of the left and right lungs. Others have regarded those of the left lung as more serious. Stivelman and Miller have examined 1,048 cases with this question in view. They have found that in early tuberculosis the right side is twice as often affected as the left. But with progression of the disease there is an increase in the number of times the left lung is seriously involved so that in advanced tuberculosis both lungs are involved an equal number of times. In those patients whose graver lesion is on the left side, the disease runs an active course in a greater number of instances than if the predominant lesion is on the right side. In early tuberculosis, the question of which lung is attacked does not affect the general prognosis. The authors try to explain the graver prognosis in cases of serious involvement of the left lung as opposed to that in cases of serious involvement of the right one. The small left bronchus and consequent poorer aeration of the left organ does not seem to them a valid reason. On the other hand, patients bear retraction of the heart and great vessels to the right better than retraction of these organs to the left. Also pulling of the diaphragm and stomach upwards is a serious factor. Interlobar fissures act as a barrier to the spread of the disease to some extent and this inhibiting or confining influence is less potent on the left side where there is only one fissure to cross, than on the right side where there are two.

Archibald Malloch

DERMATOLOGY

Yeast Infections of the Skin. Greenbaum and Klauder. *Arch. Dermat. and Syph.*, Vol. V, No. 3, p. 332.

Stating that of the family of Saccharomyces very few play an active part in Dermatomycoses, excepting superficial thrush infection, the authors report an intensive cultural investigation of the yeast flora of the normal skin taking their cultures from the axillae, inguinal folds and interdigital spaces of the fingers and toes of 150 persons. They obtained and classified three types of saccharomyces and one of cryptococcus and did animal inoculations, obtaining negative results with the saccharomyces but both animal and autoinoculation experiments were positive with the cryptococcus. They report seven cases, six of a few weeks to few months duration and one of eight years. Some of these were pathogenic to animals showing that yeasts like cocci often become pathogenic through passage through a host. The lesions involved the interdigital spaces, one type was dry showing a bright red dermis through a glistening thinned epiderm, the other composed of a mass of undermined sodden epiderm, moist and white in colour. Treatment consists in keeping the hands dry and applications of 10% iodine or 1% chrysarobin and iodine salve. A number of photographs illustrate the lesions and cultures. W. R. Jaffrey

SURGERY

The Physician and Surgeon. Cushing, Harvey. *Boston Med. and Surg. Jour.*, Vol. 187, p. 623, November 2, 1922.

"No one can be a good physician who has no idea of surgical operations, and a surgeon is nothing if ignorant of medicine." Upon this extract from the writings of Laufranchi, the author bases his article. The perfection of many elaborate methods of diagnosis has taken up too much of the physician's time in recent years. Too little time has been spent on therapeutics, which from the patient's point of view is relatively much more important.

Surgical therapy, however, has developed amazingly. A check-rein has been necessary in a few instances to curb its progress.

These two main branches of clinical medicine, although supported by a common foundation, have seemingly wandered wantonly apart. Internists have been too often theorists. The inevitable has happened. The principal object of clinical medicine has been obscured by a mass of ideas, both therapeutic and diagnostic which have accumulated for many decades, and have become debris.

On the other hand, the surgeon has centered his efforts on a part to the detriment of the whole. He has been too frequently a technician.

When physicians acquire a more intimate knowledge of surgery, fewer people will procure the needed operation too late. When surgeons are required to pcssess a thorough grounding in general medicine, fewer unnecessary operations will be done. H. Maitland Young, M.D

Indications for and against Operation in the Treatment of Injuries to the Head.

Sharpe, William. *Am. Jour. Surg.*, vol. 36, p. 262, November, 1922.

Even trivial injuries to the head require very careful investigation, especially in children. It is of utmost importance to determine the site of any brain injury, but, it is imperative to ascertain the presence or absence of an increase in intracranial pressure. In relation to treatment, the presence of a fracture is the least important fact to establish, with, of course the exception of depressed fractures. Moreover, early diagnosis is essential. To this end, particular attention should be given to the eye-grounds, and cerebrospinal pressure should be measured with the spinal manometer. Medullary compression, must, if possible, be avoided.

Choked disk does not occur in the presence of shock. The blood pressure, however, rises and remains continuously greater than the intracranial pressure as shock passes off. This produces a dilation of the retinal veins resulting in a retinal oedema. This papilledema or choked disk is an accurate sign of increased intracranial pressure, but as shock often lasts six hours, repeated ophthalmoscopies may be necessary.

Cerebrospinal pressure, measured with a mercurial manometer by lumbar puncture, is even a more accurate sign. The normal pressure is 5-9 m. Hg. Any rise to above 15 m. Hg. is distinctly positive. If one waits for more definite signs the mortality reaches 50% or even more. Lumbar puncture, itself, aids materially in relieving symptoms of a mild increase in intracranial pressure, but if used in subtentorial lesions or high intracranial pressures there is great danger of medullary compression.

Severe shock and medullary collapse prohibit operation. Operations should never be delayed in order to obtain an x-ray plate. These only help in doubtful cases of depressed or latent fractures. Subtemporal decompression is the operation of choice and in the absence of localizing signs should be done on the right side in right-handed persons to avoid the speech centre. If at operation the brain protudes, a similar procedure should be conducted on the opposite side. In a series of five hundred brain injuries, 31% showed signs of intracranial pressure. By careful consideration in regard to the advisability, type and time of operation the mortality was reduced from 50% to 30% by the author. Excluding moribund cases the mortality was 19%.

H. Maitland Young

Shall We Decompress for Choked Disk?

Sachs, B. *Arch. Neur. and Psych.*, vol. 8, p. 515, November, 1922.

The author bases his article on a series of cerebral tumour cases from his own clinic. Out of 140 cases, forty-five (32%) were unlocalized and ninety-five (68%) localized.

Of the ninety-five cases papilloedema and choked disk were present in sixty-four (67%) and absent in thirty-one. The situation of the tumour, however, had some effect on their incidence. Choked disk was present in seventeen out of nineteen cerebellar tumours (89%). In hypophyseal tumours it was present in three and absent in twelve; in frontal tumours nine out of thirteen cases (69%). It was practically a constant finding in temporo-sphenoidal tumours.

Sachs concludes that the ordinary decompression operation seldom gives satisfactory relief for choked disk. It failed completely in twenty-nine out of thirty-eight of his cases. He believes that one should make every effort to localize and, if possible, eradicate the tumour before relying upon simple decompression for relief in such cases. Too often the decompression operation is discouraging to both patient and surgeon, and before its maximum usefulness is reached it must be made harmless as far as the patient's life is concerned. Moreover, it must not in any way interfere with subsequent successful removal of the tumour. H. Maitland Young

Electrocution by 110 Volt Alternating Current. Balthazard, V. *Bull. Acad. de Med.* Paris, Vol. 88, p. 111, October 10, 1922.

In attempting to put out a fire caused by a short circuit, a man whose hands and feet were wet having seized with the left hand a cut end of one of the wires, immediately fell unconscious, with cyanosis and dyspnoea. Death resulted almost immediately in spite of artificial respiration. Small burns were found in the left hand. Owing to the wide contact, none were found on the feet.

Electricity acts on the organism in proportion to the intensity of the current transmitted. This intensity is dependent upon the voltage of the current and the resistance of the organism. It is expressed by the formula $I = E \div R$. ($E =$ voltage, $R =$ resistance). Ordinarily, the body resistance is equal to over 10,000 ohms. With an alternating current of 110 volts the resultant intensity is 11 ma. (milliamperes) which is quite harmless. But the body resistance may be decreased to 1,000 ohms if the points of bodily contact with the wire and with the ground are greasy, moist or immersed in water. Under such circumstances the intensity of the current would amount to 110 ma. Experimentally, 80 ma. will kill a dog and it is probable that 100 ma. will surely kill a man. Cardiac and renal lesions, however, seem to predispose to electrocution.

H. Maitland Young

The Relation of Fibrosis and Hyalinization to Longevity in Cancer. A study of 194 cases. MacCarty, William C. *Jour. Lab. and Clin. Med.*, vol. 8, p. 42, October, 1922

There are four factors which tend to increase the postoperative length of life in cancer, viz: lymphocytic infiltration, cellular differentiation, fibrosis and hyalinization. In June 1921, the author published observations on the first two factors in cases of gastric carcinoma. Fibrosis and hyalinization are infrequently seen in gastric carcinoma. Cancers of the breast and rectum, however, more frequently present these factors. Two series of patients, all of whom had died of recurrence or metastasis following radical operations, were studied. The conclusions drawn were:

(1) In cancers of the breast and rectum fibrosis occurs with almost equal frequency.

(2) Cancers of the breast more often show hyalinization than do those of the rectum.

(3) Fibrosis, when present alone, increases postoperative length of life. (34% of cases studied).

(4) Hyalinization, when present alone, also increases postoperative length of life. (40% of cases studied).

(5) When both fibrosis and hyalinization were present postoperative life was increased 56%.

H. Maitland Young

Suppurative Osteomyelitis Due to the Colon Bacillus. Winslow, N. *Annals of Surg.*, December, 1922, p. 695.

Colon infection only occasionally passes beyond the confines of the abdominal cavity (Cushing). To date, only seven cases are reported in which colon infection was present in bone suppurations of metastatic origin. Five gave a history of previous typhoid fever. The cases are equally divided as to sex, and age seems to play no part in the incidence. The bones involved were femur, 3, tibia, 1, costal cartilages, 3.

Two cases with mixed infections died. The time of appearance of the lesion was:—as the initial lesion, 1: fourth week of illness, 1: near the close of a typical typhoid, 7: five months after receipt of gun shot wound of bone, 1: twenty years after an attack of typhoid, 1. A. T. Bazin

Treatment of Acute and Chronic Simple Traumatic Synovitis by Aspirations and Immediate Active Mobilization. McWilliams, C. A. *Annals* of *Surg.* December, 1922, p. 677.

The author considers that the Willems method of arthrotomy without drainage and immediate active mobilization has definitely settled the question of treatment of suppurative arthritis of the knee. He considers that similar treatment is indicated in simple traumatic synovitis of the knee and advocates repeated aspirations with immediate active mobilization of the joint. He decries fixation and rest even in acute conditions and states that the method is followed by needlessly prolonged convalescence. He quotes, *in extenso*, numerous authorities and criticises the plans adopted by them. He illustrates his argument by case reports and concludes, that,

(1) Repeated aspirations combined with active (never passive) motions, and walking without splints afford the best method of treatment in acute and chronic traumatic joint synovitis, provided there be no joint mouse nor dislocated meniscus present.

(2) Aspiration relieves pain immediately, renders a correct diagnosis more certain, prevents stretching and consequent weakening of the ligaments and avoids muscular atrophy.

(3) Such treatment renders unnecessary all other physiotherapeutic measures the effects of which have been overestimated and which have been applied in an irrational and empiric manner and are makeshifts to excuse procrastination.

A. T. Bazin

Double Lip. Dorrance, G. M. *Annals* of *Surg.* December, 1922, p. 776.

Double lip may be a congenital deformity but is usually seen after the eruption of the second teeth. The author has never seen it develop after the age of twenty-one. It consists of a redundancy of the mucous membrane, and protrudes from beneath the margin of the upper lip pushing the latter upward. The submucous tissue is always in excess, the labial glands are enlarged. Treatment is resection, local anaesthesia being employed. Diagrams illustrate the steps of the technique. A. T. Bazin

Submaxillary Salivary Calculus. Buzby, B. F. *Annals of Surg.* December, 1922, p. 778.

Salivary calculus is more frequent in the submaxillary than in the parotid inasmuch as the saliva from the former is much more rich in mineral salts. Infection and stasis are etiological factors. Males are more frequently affected than are females and the age incidence is commonly in the third and fourth decades. The stones may occur in either the gland or in the duct, may be single or multiple and may attain considerable size.

The history of duct stone is typical. A swelling of the gland, painful and tender, occurs coincident with mastication and function. This swelling gradually disappears after cessation of stimulation of function.

In gland stone, the swelling is not intermittent but gradually progressive with increase in pain and tenderness. Diagnosis is determined by bidigital palpation and the x-ray. Treatment consists of intra-oral incision for duct stone, but in removal of gland in gland stone, or associated hyperplasia or abscess of gland. General anaesthesia is advantageous. A. T. Bazin

Aseptic Resection of Intestine. Collins, F. K. *Annals of Surg.* December, 1922, p. 739. Horine, C. F. Annals of Surg. December, 1922, p. 745.

The two articles deal with a new technique for the aseptic end to end anastomosis of intestine, both large and small. In each instance the procedure has been tested experimentally and clinically and has proven its worth. The descriptions are clear and concise and the steps are adequately illustrated by diagrams. The technique is simple and rapidly carried out with or without an assistant. The articles are well worth the study of those employed in operations on the abdomen. A. T. Bazin

ANAESTHESIA

Bronchopulmonary Complications Following Operations Under Anaesthesia. Lamb, David. *B.M.J.*, November 11, 1922, p. 915.

Slight cough, with, or without expectoration, and without pyrexia, is common after anaesthesia and is due to irritation of the upper air passages. Sometimes on the day after operation the temperature rises to 100° F., or perhaps higher. There is a sense of discomfort in the chest and cough. After three or four days there is muco-purulent expectoration, sometimes very free. These latter cases are apparently abortive pneumonias. The radiogram shows a distinct shadow, most frequently in the lower lobe of the right lung. Over this area bronchial breathing can generally be heard. The majority of these cases is associated with the pneumococcus, the remainder with the B. influenzae a streptococcus, or with B. mucosus capsulatus. The germs in the mouth and pharynx get mixed up with the excess of mucus and saliva, and infection of the bronchi results.

In addition to this mild type of case, all the ordinary forms of pneumonia and bronchopneumonia may occur. The infective organisms may be carried to the lungs by the blood, the lymph, or by an embolus.

The frequency of pulmonary complication after operation, is hard to determine. When ether has been administered they are attributed to the anaesthetic, but after other anaesthetics they are generally ascribed to other causes. They are undoubtedly most frequent after abdominal operations, especially in the upper abdomen. The restraining effect on respiration of tight bandages and the inhibitory effect of pain in the wound, are partly responsible.

Of five cases of lobar pneumonia, following operation, investigated by the writer, four were suffering from colds in the head and one had just recovered from influenza at the time of operation. Two had had chloroform and three C2 E3 followed by chloroform alone. All the circumstances of an operation lend themselves to possible chill and exposure, unless constant care and watchfulness are exercised. The wonder is, not that pulmonary complications arise, but that they do not arise more frequently.

Flagg, of New York, is quoted as saying: "It is a quite generally accepted fact in the circles wherein I work that there is no such thing as ether pneumonia, that the post-operative pneumonias which we see are due to exposure before, during and after operation, the development of an infection already present, or of embolic origin. Mikulicz found post-operative pneumonia more frequent after chloroform than after ether and most frequent after local anaesthesia.

A case is quoted in which ether given by the rectum proved fatal in a case of malignant disease of the larynx with signs of excessive irritation of the bronchial mucous membrane.

Postoperative pleurisy, empyema and abscess of the lung, are usually associated with subdiaphragmatic abscesses connected with septic gall bladders or appendix cases, or they result from emboli from other septic areas.

Abscess of the lung is of occasional occurrence after tonsillectomy, though rare after other operations, even when extensive, in the mouth and throat.

Pulmonary embolism and infarctions are met with in patients over forty-five and usually after abdominal operations. The site of thrombosis is usually in the iliac or femoral vein or in the inferior vena cava.

Among the various measures recommended for the prevention of broncho-pulmonary complications, perhaps the most important is the postponement of an operation if there are any signs or symptoms of nasal or bronchial catarrh.

If the operation cannot be postponed every care must be taken to prevent the patient catching cold. Ether should be avoided. In abdominal or breast cases, bandages should be applied lightly. In mouth cases especially, the patient should be kept on his side after the operation. In cases of intestinal obstruction with vomiting, the stomach should be washed out before the operation and, if necessary again before recovery of consciousness.

W. B. Howell

Obstetrical Anaesthesia from the Anaesthetists View Point. Coburn, Raymond C. *New York State Jour. of Med.*, November, 1922, p. 499.

The advantages of nitrous oxide over other anaesthetics in labour are several. There is no extra strain thrown on the organs of elimination. Contraction of the uterus is stimulated and labour shortened. The patient's vital forces are conserved. The effects of nitrous oxide are quickly secured and elimination is so prompt that the patient is subjected to its influence only during the time it is needed. The baby is not affected.

Analgesia is obtained by giving nitrous oxide with a larger percentage of oxygen than is used for anaesthesia. Much of the success in the use of nitrous oxide depends on the patient's attitude and her power to cooperate.

The time when the administration should be begun differs in different patients, but it is generally, in pluriparae, when there is three or four finger dilatation of the cervix. In primiparae it is usually a little later and sometimes not until the beginning of the second stage.

At the beginning of a contraction the mask is quickly applied and the patient is told to take three or four deep inhalations, and then to hold her breath as long as possible, and bear down. Holding the breath prevents the rapid loss of gas through exhalation, and bearing down, by increasing the intrapulmonary pressure, increases the rate of absorption. At the same time the expulsive force is increased. Later when the contractions become more painful, six or eight or even ten breaths of nitrous oxide must be taken. Only sufficient gas should be given to produce analgesia, so that voluntary efforts can be made. In this way the duration of labour is materially shortened. It is important to avoid cyanosis.

When the contractions are too strong, considering the resistance to be overcome, nitrous oxide analgesia should not be used. It is better then to use ether or chloroform.

If an anaesthetist is not available, the patient may be taught to apply the face piece of an automatic apparatus herself.

When intermittent analgesia is employed there is no difficulty with the baby. When, in addition to the analgesia, ether or chloroform is used, there is less difficulty than when these agents are so used without the preceding analgesia.

Whenever the baby is cyanotic at birth and the cord is still pulsating, several inhalations of pure oxygen by the mother before the cord is tied will quickly improve the child's colour.

W. B. Howell

The Action of Stovaine and Novocaine upon the Bulbar Centres.

(Action de la Stovaine et de la Novocaine sur les Centres Bulbaires.) Camus, Jean. *Paris Medical*, March 11, 1922.

The writer injected solutions of stovaine and novocaine directly into the neighbourhood of the bulb in dogs with a view to finding a means to treat cases of spinal anaesthesia, where the bulbar centres are affected.

He found that these substances have a selective action on the respiratory centre. Kymographic tracings are shown, demonstrating the gradual cessation of breathing. After cessation, stimulation of the central end of the cut pneumogastric had no effect. Previously this had caused accelerations of the respirations. Properly performed artificial respiration re-established the normal rhythm and then stimulation of the vagus had the same effect as before cessation. Other centres retain their activity for a while after the respiratory centre is paralysed. During periods of artificial respiration when this was temporarily stopped the variations in arterial pressure and in the rate of the heart could be demonstrated on the kymograph.

In dogs which have received a dose slightly smaller than the usual fatal dose, the respiratory centre being to a certain extent affected, any slight shock, such as that due to a change in position, would cause death from syncope. In less serious syncope caffeine seemed to act as an antidote. If the minimum fatal dose is exceeded, caffeine will not start respiration.

The writer considers caffeine a very useful adjunct to artificial respiration in the treatment of accidents due to stovaine and novocaine.

Artificial respiration must be regular and rhythmical. He has seen breathing reappear after an hour in dogs.

W. B. Howell

The Effect of Magnesium Sulphate on the Secretion of Bile.—Experiments were undertaken by Emmett B. Frazer, Rochester, Minn., in order to determine whether magnesium sulphate introduced directly into the duodenum or into the circulation would cause any change in the volume or in the character of the bile. The technique employed was simple and easily executed. When the common duct was cut at its entrance into the duodenum, any nerve path which might have passed by this route was also severed. If a nerve reflex was dependent on such a route it would have been abolished. It was found that the rate of flow of bile in the control experiments was more uniform when the animals were fasting; therefore, any fluctuation in the rate of flow after the injection of magnesium sulphate could best be determined in the fasting state. After intraduodenal injection of magnesium sulphate, the duodenum, which was clearly visible through the skin, at first contracted and then remained markedly relaxed for from thirty minutes to one hour. This initial contraction was probably due to mechanical stimulation by introduction of the needle and the solution. The results of these experiments were entirely negative. When magnesium sulphate solution was injected directly into the duodenum of dogs or injected into the circulation, there was neither acceleration of the rate of flow of bile, nor change in the colour. In many instances the rate was even somewhat retarded. When bile was injected into the duodenum, there was a definite, prompt, increase in the flow of bile.—*Jour. Am. Med. Assoc.*, November 4, 1922.

History of Experimental Scarlet Fever in Man.—Ludvig Hektoen, Chicago, presents a brief review of the recorded attempts to produce scarlet fever experimentally in man, which reveals that it is exceedingly doubtful whether a single positive result has been obtained. In view of the ease with which scarlet fever appears to be transmitted under natural conditions and the not infrequent occurrence of surgical scarlet fever, Hektoen says the failure of the efforts at experimental transmission is a perplexing problem that awaits solution.—*Jour. Am. Med. Assoc.*, January 13, 1923.

News Items

GENERAL NEWS

Dental Surgeons on the outlook for early signs of Malignant disease.—More than 6,000 dentists from all parts of North America when they gathered at their Annual Meeting in Chicago, were cautioned to be on the outlook for early signs of malignant disease. Every dental patient, whether he asks for it or not, should be examined for any lesions in the mouth which might develop malignancy, before work is begun on the teeth. With the full co-operation of dentists throughout the country, 50 to 75 per cent of patients having growths or mouth lesions can be "cured without awaiting the hideous mutilation which results when a developed growth is removed," Dr. Daniel U. Hoffman declared. "The man or woman who has a sore or canker on the tongue or cheek that does not heal within a couple of weeks has received a decided warning. The cold sore on the lower lip that is found in inveterate pipe or cigarette smokers is a danger sign that must be heeded." The value of the campaign of prevention was stressed by Dr. John H. Cadmus, "Although years and years of research and millions of dollars have been spent in the attempt to discover the cause of cancer, no one knows the cause," said Dr. Cadmus. "We do know that it is more prevalent in this latitude, however, and, realizing that it must be detected and removed at the beginning to avoid the horrible disfigurement necessitated by cutting away flesh around cancerous lesions to prevent fresh growth, we have decided to make the dental profession the first line of defence against the disease." Dr. Cadmus spoke in opposition to the popular impression that radium can be used to cure cancer. "It is used in internal and especially malignant growths where an operation would result in death, but it cannot cure," Dr. Cadmus asserted. "At most it can only check the growth of the disease." The number of deaths caused by cancer each year in the United States is estimated to be 50 per cent greater than the total number of American troops killed in the world war. G. H.

NEW BRUNSWICK

The appointment of Dr. E. J. Ryan to the commission which governs the General Public Hospital gives a much needed greater representation on the Board to the Medical Profession. For years there were always four and sometimes five doctors on the commission of nine with a medical man as superintendent. Gradually this was changed so that until this appointment was made there were only two medical men on the board—one of whom has long since ceased to practice, the other being the Minister of Health whose multitudinous other duties made it impossible for him to devote much time to the hospital. This condition of affairs in conjunction with a non-medical superintendent was rather unsatisfactory and it is hoped that in future appointments, the Medical representation will be increased until at least a majority of the Commission will be familiar with hospital affairs.

A campaign to stamp out Venereal Diseases is soon to be staged in New Brunswick under the auspices and guidance of the Ministry of Health. As far as can be learned it is to be put over without any help from the medical men of the province, at least none of them are amongst the officers or those present at the meeting for organization. The only doctor holding office is a doctor of philosophy. He will prove his worth if he is able to guide their train of thought so as to avoid the making of impossible and impracticable suggestions; but that is almost too much to expect from a lay committee on which medical representation is denied. Mrs Emmeline Pankhurst of suffragette fame in England is the headline attraction and her reputation and personality will no doubt attract crowded houses.

The Health officials of this province evidently do not want or need the co-operation of the profession. The statute book is being filled with health laws of which enforcement is not being attempted (i.e. reporting of venereal cases etc.); the municipalities are fighting others in the courts and one is almost led to believe that there must have existed a Ministry of Health when Virgil wrote:—"Quos Deus vult perdere prius dementat."

The sympathy of the profession is being extended to Dr. W. D. Rankine of Woodstock who recently lost by fire his office, library, house and contents. The family were considered fortunate in escaping from the burning building, so fast did the flames advance. Happening just before Xmas on a bitterly cold morning (over 30 degrees below zero) it caused even more distress than such a destructive blaze ordinarily would. That it did not daunt our worthy confrere was made evident by the fact that a few days later he notified the programme committee that he would contribute a paper on "The Septic Ear" at the Maine—New Brunswick joint meeting.

The standardization of the St. John hospitals necessitated the revision of the conditions under which physicians practised in them. To deal with the matter the staff of the General Public Hospital—the largest hospital in the Maritime Provinces—appointed a committee consisting of Dr. John S. Bentley, Chairman and Drs. G. A. B. Addy and E. J. Ryan to draw up regulations which conformed to the requirements of standardization and to which all doctors desirous of practicing in the hospital must subscribe. The committee had great difficulty in ascertaining just what was required by other hospitals, but finally after a large amount of correspondence and work had been done by Dr. Bentley, formulated the following regulations. They were accepted *in toto* by the Commissioners of the hospital and hereafter all men priviliged to practice in it must sign a declaration to the effect that "they agree to abide by the rules and regulations of the General Public Hospital, a copy of which has been submitted to them." Knowing the difficulty (or rather the impossibility) of getting a ready made set of regulations the writer feels that these are worthy of publication in the Journal as they may form at least the groundwork on which other hospitals newly standardized may build.

REGULATIONS

1. No physician or surgeon who divides fees will be allowed to practice in the hospital.
2. Where possible autopsies shall be held, and the autopsy records shall be filed with the case records.
3. The pathological, bacteriological and x-ray findings shall be filed with the case records.
4. The physical examination shall be made and recorded by the house officer.

5. In all cases the attending physician or surgeon shall be held responsible for the records of his patients.

6. A tentative diagnosis shall be made in all cases within 48 hrs of admission.

7. In surgical cases the surgeons pre-operative diagnosis shall be posted in advance of operation.

8. The post operative diagnosis shall be recorded immediately after the operation; all tissues removed shall be sent to the pathological laboratory for report.

9. Follow up records shall be kept by a record clerk.

10. Throat smears and other examinations in regard to infections shall be made of all children admitted to the children's department. Vaginal smears shall be made in suspicious cases.

11. It shall be the duty of the chiefs of service to instruct the house officers at the bedside upon the salient points of diagnosis and upon the management of cases

12. The superintendent shall keep a record of the house officers regarding their personal conduct and professional ability.

13. A committee of five shall be appointed annually by the commissioners on the recommendation of the staff, and this committee shall require that the proper methods of efficiency be maintained throughout the hospital.

14. A meeting shall be held each month of the entire medical staff. A written notice shall be sent to each member three days before the date of meeting. Failure to attend three consecutive meetings without an excuse acceptable to the staff will be followed by a recommendation to the commission for the dismissal of the delinquent from the staff.

15. At each meeting the clinical experience of the group in the various departments of the hospital shall be reviewed and analysed, the basis of such review and analysis being the clinical records of all patients, both pay and free.

16. A summary of the month's casualties such as deaths, infections and complications, shall be prepared by a committee of the staff for the use and convenience of the group meetings, and this summary shall become a part of the permanent hospital records.

17. The staff shall consist of all registered practitioners of the City and County of St. John who have subscribed to the hospital regulations and have obtained the privilege of treating patients in the hospital.

18. The officers of the staff shall be a chairman, a vice-chairman, and a secretary, The chairman and the secretary shall be members of the hospital medical board. In addition to his regular duties the secretary shall keep a record of the attendance at meetings.

19. The officers of the staff shall be elected by nomination and ballot at the regular meeting in December, and shall assume office at the first meeting in January.

20. The order of business at staff meetings shall be:—

(a) Presentation of interesting pathological material collected through the month, with remarks by the pathologist.

(b) Reading the casualty report and discussion of same by physicians and surgeons responsible for the case or cases in question as well as by others.

(c) Opportunity for report of cases of special interest which have been treated during the month. E. J. R

QUEBEC

Dr. C. F. Martin of Montreal, is at present in Europe but is expected to return to Montreal early in February.

At a special meeting of the Medical Association of the East of Montreal held Wednesday, January 10th, the proposals of certain Companies to insure the individual clientele of members of the profession who took stock in their Company was discussed, and it was finally resolved that the Medical Association of the East of Montreal as a body resolves to have no professional dealings with Companies proposing unethical relations between patients and the profession, and request the Secretary to forward a copy of this resolution to all Medical Journals.

New Hospital in Quebec Planned.—The Hospitalieres Sisters, who have been administering the Hotel Dieu in Quebec, since the first days of the colony, have accepted charge of a new hospital to be erected on Ste. Foye road, in the new parish of the Holy Sacrament. This parish is in charge of the fathers of the Holy Sacrament of Montreal. The present Hotel Dieu is too small to handle the increasing number of cases and the new one will be used as a general hospital.

Jail and Big Fine for Fake Doctors.—Amendments to the Quebec Medical Act approved by the Lower House, were approved in the public bills committee of the Legislative Council after a number of the proposed changes had been slaughtered, largely through representations by osteopaths of the province. As finally approved anyone who assumes the title of doctor without qualification, whether in newspaper advertising or by other means, is liable to fines ranging from $50. to $200. Improper advertising of this character, too, carries three months in jail as well as the $200. fine for any offence subsequent to the second. The big fight on the bill staged by the osteopaths was on the proposed clause that: "Without previously obtaining authorization from the Lieut-Governor-in-Council, it is forbidden to keep an institute, private hospital, home for convalescent or sick persons, maternity hospital or establishment where consultations and treatments are given." That was dropped after a lawyer of Montreal, had waged the osteopaths' fight in committee.

Osler Collection.—The Medical Library at McGill University will be permanently enriched before the end of this year by the addition of the collection of books on the history and development of medicine, numbering in all some 8,000 volumns, bequeathed by Sir William Osler, to McGill School of Medicine in his will. The collection which is now being arranged and catalogued at Oxford University, England, will be brought out to Canada by Sir William's nephew, Dr. W. Francis, who will remain in charge of the collection at McGill after its installation in a room in the New Medical Building which has been specially remodeled for its reception. Sir William Osler's bequest makes McGill Medical School the possessor of the finest collection of its kind in the American Continent. It includes a large number of valuable old manuscripts, and old works collected all over Europe, and will add greatly to the prestige of McGill. The collection is expected to reach Canada in the latter half of this year

G. H.

ONTARIO

The Southern branch of the Simcoe County Medical Society met in Alliston, on December 14th, 1922. The President for the ensuing year will be Dr. A. F. McKenzie, and the secretary, Dr. J. M. Walker. Dr. Gwyn, of Toronto, spoke on the "Diagnosis of Pneumonia and Empyema."

The Federation of American Societies for Experimental Biology held their annual meeting in Toronto, on December 26, 27, 28, 29. A highly interesting programme was presented. Of special importance was the joint session of the physiological, biochemical, pharmacological and pathological societies. At this session many of the problems in the treatment of diabetes by Insulin were taken up. Papers were presented by Drs. Banting and Best, by Professor Macleod, and other members of the physiological department. Many tributes of commendation were given to Dr. Banting and his co-workers by the visiting scientists, and it was evident that the interest of the continent at large has been attracted by the recent discoveries in this line in the Toronto laboratories. Many remarkably interesting papers were presented in other sections and there was an unusually large attendance at all the demonstrations. A special visitor at the meeting was Professor R. Barany, of the University of Upsela.

The Niagara District Medical Society met at Welland on January 4th. Considerable business which will be discussed later, business dealing with the reorganization and reformation of the county societies, was transacted. Dr. T. C. Routley, of Toronto, the secretary of the O.M.A., addressed the meeting in the above connection, and Dr. Gwyn, of Toronto, spoke on the "Diagnosis and Treatment of Pneumonia and Empyema."

Obituary.

Dr. Peter Alexander McDougal, one of Ottawa's oldest practitioners, died on December 10th, in his 83rd year.

Dr. Charles McKenna died in Toronto on January the 8th, aged 78. He had graduated from the Toronto School of Medicine in 1865, and had been in continuous practice in Toronto since then.

Dr. Henry Hollingsworth Moorehouse, one of the oldest practitioners of the Province, died in Oakville, on Saturday, December 23rd.

Dr. D. W. McPherson, died in Toronto, on January the 3rd, in his 51st year. A graduate of the old Trinity Medical School, Dr. McPherson had long practised in Toronto, and had established a large practice, which he unselfishly sacrificed in the beginning of the war to go overseas as the commanding officer of No. 2 Field Ambulance. With this unit he went to Salisbury Plains and subsequently to France, and was with the Canadians in all their early activities. He was later transferred to England, and placed in charge, first, of Lady Astor's hospital, at Taplow, and later at the Ontario Hospital, at Orpington. Prior to his service overseas, Lt. Colonel McPherson had been for many years a member of the Militia and had been commanding officer of the old 11th Field Ambulance. For his services in the war, services of the highest order, Colonel McPherson was awarded the honour of C.M.G.

Urinary Infection.—A. S. Roe considers that absorption of bacteria into the blood, obstruction to the urinary outflow, and disturbances in metabolism producing a highly irritating urine, are the three factors concerned in the production of urinary infection. While these may operate either singly or in conjunction, the last appears to be the most important from the point of view of preventive medicine. In the majority of cases the urine is definitely acid, while fatigue is a prominent factor in determining an attack, and the disturbance in metabolism, by producing a highly irritating generally acid blood, impairs kidney efficiency and lowers resistance. The elimination of bacteria which have been absorbed into the blood from such foci as the bowel, teeth, tonsils, pelvis, etc., also takes place through the already damaged kidneys, producing still further damage, with a resulting renal infection. Similar infection also follows from the presence of bacteria alone if there is obstruction to the urinary outflow from stricture, stone, prostatic disease, etc., though in obstinate cases foci of infection must be sought for as well. The physiological conditions tending to cause disturbances in metabolism are those associated with deficiencies in diet, disorders of internal secretions connected with pregnancy, puberty, and the climacteric, and physical or mental disturbances resulting from fatigue.—*Med Jour. of Australia*, October 14th, 1922.

Book Reviews

Diseases of the Heart A handbook for students and practitioners. By I. Harris, M.D. Demy 8vo, pp. xii+196, 56 figures in text. Price, 10s6d. London, Bailliere, Tindall and Cox, 1922.

In this little volume, the author, who is Honourary Physician to the Liverpool Northern Hospital and in charge of the cardiographic department, outlines the general principles of cardiology, including clinical methods of investigation and treatment. It is an excellent small manual giving in concise form a summary of present day knowledge of symptoms and treatment of heart disease.

J. H. E.

Diseases of Infancy and Childhood. Their dietetic, hygienic and medical treatment. By Louis Fischer, M.D. Ninth revised edition. Published by F. A. Davis Company, Philadelphia, 1922, in two volumes. Volume 1, treats of infant feeding and the organic diseases, with 146 illustrations and thirty-seven colour plates.

The author has endeavoured to cover the subject of pediatrics in this work, but many of the descriptions are incomplete. A number of the subjects treated do not refer to the most recent works, while Volume II is occupied almost entirely with the infectious diseases, a rather uneven division of the subject of pediatrics.

A. B.

Principles and Practice of Infant feeding By Julius H. Hess, Chicago. Published by F. A. Davis Company, Philadelphia.

This book follows the usual type of text on infant feeding and, with few exceptions, portrays the accepted thought and principles laid down in this branch of work. The author commences with a concise description of the anatomy and physiology of the digestive tract of the infant, and follows with a complete description of maternal nursing and a discussion of artificial feeding and foods. The chapter on metabolism is especially to be commended to the student as the recent findings in this branch of the work are carefully tabulated. The latest work on the deficiency diseases is well presented. The appendix contains a good list of all infant foods, diets, food recipes, and weights and measures.

A. B.

The Process of Diagnosis including the Method of History Taking and Physical Examination of Surgical Cases. By E. Stanley Ryerson, M.D., C.M. Price, $1.00. University of Toronto Press, 1922.

This small volume of about one hundred pages of text has been written by an experienced teacher with the aim of instructing the student entering on the study of clinical surgery in the proper method of arriving at a correct diagnosis, always an essential prelude to successful treatment. He emphasizes the importance of system, of close observation, and of concentrated attention; all most important in securing correct results. He describes the difficulties to be overcome in history taking and details the standard methods of inspection, palpation, percussion and auscultation as demanded in surgical practice. The last few pages of the book are occupied by a list of the more important recent books suitable for the student's reading or reference, not only on general surgery but also in its various special departments. The book is to be commended to all students as presenting in small compass the important facts which must be mastered by them. It is of convenient size to be carried in the pocket, and used for reference when at work in the ward.

A. D. B.

The Medical History of the War which is to appear in twelve volumes under the general editorship of Major-General Sir W. G. Macpherson, K.C.M.G., M.B., will form a part of the *History of the Great War based on Official Documents.* The volumes under preparation will appear under the following titles: General History of the Medical Services (4 volumes), The Diseases of the War (2 volumes), The Surgery of the War (2 volumes,) the Hygiene of the War (2 volumes), Pathology and Medical Research during the War (one volume), Medical Statistics and Epidemology (one volume). The general desire in the medical world for a medical history of the war in accessible form was first brought to notice by Professor Adami, in September, 1914, in a letter to Sir Wm. Osler, in which he pointed out that in none of its wars had Great Britain thoroughly worked up its medical history. This letter was forwarded to the Director General of the Medical Services in November, and prompt action was taken in the matter. More than 38,000 war diaries, in addition to a large number of reports from commands at home and overseas, and administrative files from the theatres of war were registered and filed at the office of staff appointed for the work. We have received recently the first volume of the General History of the Medical Services, the first volume of the Diseases of the War, and the first volume of the Surgery of the War. The subsequent volumes will receive notice as they appear.

History of the Great War—Medical Services, Diseases of the War. Vol. 1. Edited by Sir W. G. Macpherson, K.C.M.G., Colonel T. R. Elliott, C.B.E., D.S.O., F.R.S., and Lieut-Colonel Andrew Balfour, C.B., C.M.G. London; H.M. Stationery Office, or through any bookseller, 1922. Medium, 8vo, pp. viii+550; 6 coloured plates and other illustrations, £1 1s. net. Canadian Agents: The British Commonwealth Publishing Co., 61 College St., Toronto.

Two volumes will be devoted to the medical diseases of the war. The later volumes will discuss nervous disorders, venereal and skin diseases, medical aspects of aviation, gas warfare and mine gas poisoning. Separate volumes as noted in a previous review will deal with Hygiene and Pathology, yet much detail of preventive treatment and pathology appears here. It is not a text book on the subjects presented but rather an historical record and is based upon the work done during the progress of the war. The final nature of the invalidism produced by many diseases cannot for obvious reasons be discussed now but must await a study of the documents in the hands of the ministries of pensions and of re-establishment. The chapters covering the different disease groups under consideration have been prepared by officers who had special knowledge and experience of the diseases of which they write, most of them of consultant standing, their posts giving them access to all official documents, while their active service work was to a great extent confined to the special branches of medicine allotted to them. The diseases dealt with in this volume comprise the infections other than venereal, the deficiency diseases, scurvy, beri-beri, famine dropsy and pellagra, nephritis and cardiovascular disorders.

We learn that the hospital admissions for disease in theatres other than France were 14.6 times as numerous as those for wounds. In 1918, the admission rate for disease was 533.1 per 1,000 strength. In England, in 1919, a peace year, the admissions were 378.4 per 1,000. These figures show the importance of disease as a cause of inefficiency in an army, and indicate the vast expense which it entails. A study of the figures prepared from the casualty clearing stations in one of the armies in France, in 1916, reveals that the group of diseases including scabies, skin diseases, boils and inflammations of connective tissue account for about twenty-five per cent. of admissions. That is, about one quarter of the sick wastage was due to simple skin lesions most of which were scabies or some form of pyodermia largely preventible by careful inspection and attention to cleanliness of the men. A second group including pyrexia of uncertain origin, trench fever, myalgia and rheumatism accounted for another twenty-five per cent. Most of these were trench fever cases, and Colonel Soltau considers from his study of these two groups that forty-four per cent. of the total admissions were due to diseases caused by dirt or lice and therefore preventible.

The practical value of research to an army in the field is illustrated by the observations on trench fever which was recognized in 1915 and proved to be infective by the inoculation of volunteers early in 1916. Had that method been pursued at the time, the pathology of the disease and the means by which it was spread would soon have been discovered, but the use of volunteers for the needful experiments at the time was not permitted, and accordingly these discoveries were postponed till 1917-1918, when, with the help of sixty or seventy volunteers, the American pathologists settled the question in three months. The delay probably meant that about 200,000 cases might have been prevented had the experiments taken place earlier.

The war has shown the immense service which original research can render to preserve the efficiency of an army, whether carried out at home or in the actual area of military operations. The mobile bacteriological laboratories played a large part in the fresh discoveries of medicine and surgery, though designed chiefly as aids to diagnosis and special treatment.

One great lesson of the war as amply demonstrated by the facts presented, is that the medical side of planning a campaign is just as necessary for efficiency as the military and the neglect of it must inevitably lead to an enormous amount of preventible and therefore unjustifiable wastage. Wherever one opens the book one finds much of interest and of value, both to the medical officer and to the physician in practice whether it be concerning influenza, the diseases due to unbalanced dietary as seen in the Mesopotamian campaign, or cardio-vascular disorders. The editor and his collaborators deserve great praise for the work they have presented us, the value of which is enhanced by a generous bibliography appended to each chapter and a copious general index. J. H. E.

History of the Great War, Based on Official Documents. Medical Services General History, Vol. 1. By Major-General Sir W. G. Macpherson, K.C.M.G., C.B., LL.D. pp. xv+463, 23 maps and charts. Price, £1, 1s. London, H.M. Stationery Office, 1921.

This first volume of the series of four promised on the History of the Medical Services, contains in its opening chapters an account of the preparation in peace of the Medical Services for war, dealing with organization, personnel and training. Then follows the story of mobilization and a chapter on hospital accommodation in Great Britain, with an outline of the disposal of sick and wounded in the British Isles. The development of the examination of recruits, of recruiting of the Medical Services, and of medical training, leads up to the story of medical stores and of surgical equipment. Sanitary organization, and demobilization complete the chapters which deal with the Medical Services at home. The remaining chapters begin the story of the Medical Services overseas. Those found in this volume comprise principally the garrisons in the Mediterranean, in the West Indies, Mauritius, the far East, West Africa and South Africa. References to the work of the services of the Dominions are promised in the succeeding volume on the Medical Services with the Expeditionary Forces in France and in the other theatres of war. Various tables of interest appear as appendices, including the Medical Units mobilized in August, 1914, the Military Hospital Ships and Ambulance transports and their time in service, a list of sixteen hospital ships destroyed by enemy submarines and mines, and tables of the sick and wounded arriving in the United Kingdom from the various expeditionary forces and garrisons overseas.

The enormous scale upon which personnel and equipment had to be provided and maintained is suggested in the statements that over 1,000,000 clinical thermometers were issued, that the dental services indented for four million artificial teeth, nearly 700 tons of plaster of Paris and thirteen and one-half tons of dental rubber. In 1916, over twenty-three tons of quinine was issued, and in the malarial season of 1917, the average amount was over six tons each month. The editor is to be congratulated upon the success with which he has given us a picture of the Medical Services as gathered from War Office files, the reports of parliamentary and other committees, the reports of administrative officers and specialists, the reports of hospital units and other sources. The succeeding volumes will be awaited with interest. J. H. E.

Clinical Electrocardiography By Frederick A. Willius, M.D. The Mayo Clinic, Rochester, Minnesota. 8vo., pp. 188, with 185 illustrations. Philadelphia; W. B. Saunders Company, 1922. Cloth, $5.50 net, Canadian Agents: The J. F. Hartz Co., Limited. Toronto, Ont.

In this monograph the author presents in concise form a summary of the subject under review. Following a consideration of the physiology of heart muscle and its nerve control, he outlines the principles of the electrocardiograph, illustrating both the Cambridge and the Hindle models and the method of application. The normal electrocardiogram is then explained with an elucidation of the mathematical basis of electrocardiography. The remaining three-fourths of the text is devoted to the clinical application of this study with many illustrative electrocardiograms. The arrhythmias, tachycardias, and disorders of conduction are illustrated, then follows a discussion of the abnormalities of the T wave and the P wave, with a presentation of the results of study of congenital heart conditions, and various heart diseases with some consideration of the changes found in patients with hyperthyroidism, myxoedema, angina, and diseases of the aorta and pericardium. The mortality incidence in the various types investigated at the Mayo Clinic is a valuable contribution to the study of prognosis. There is a short bibliography of important references appended to each chapter. J. H. E.

Books Received

International Clinics Volume IV, thirty-second series, 1922. Edited by Henry W. Cattell, A.M., M.D., with the collaboration of Chas. H. Mayo, M.D. 301 pages, illustrated. Published by J. B. Lippincott Company, 201 Unity Building, Montreal.

Text Book of Pediatrics Edited by Prof. E. Feer, translated and edited by Julius Parker Sedgwick, B.S., M.D.; and Carl Ahrendt Scherer, M.D., F.A.C.P. 852 pages, with 262 illustrations. Published by J. B. Lippincott Company, Philadelphia, and Unity Bldg, Montreal, 1922.

Generalized Pain Clinical symptomatology of internal diseases. By Professor Dr. Norbert Ortner, Vienna. 569 pages. Published by The Medical Art Agency, New York.

Diseases of the Heart. By John Cowan, D.Sc., M.D., F.R.F.P.S., and W. T. Ritchie, O.B.E., M.D., with a chapter on The Ocular Manifestations of Arterial Disease by Arthur J. Ballantyne, M.D., F.R.F.P.S. 585 pages, illustrated. Price, 30s. net. Published by Edward Arnold and Co., 41 Maddox St., London, W.

Medical History of the War, Surgery, Volume II. Edited by Major-General Sir W. G. Macpherson, K.C.M.G., C.B., LL.D., Major-General Sir A. A. Bowlby, K.C.B., K.C.M.G., K.C.V.O., Major-General Sir Cuthbert Wallace, K.C.M.G., C.B., and Colonel Sir Crisp English, K.C.M.G. 579 pages, illustrated. Price, 26 shillings, post free. Published by His Majesty's Stationery Office, Imperial House, Kingsway, London, W.C.2, 1922.

Electric Ionization. A practical introduction to its use in medicine and surgery. By A. R. Friel, M.A., M.D., F.R.C.S.I. 129 pages, illustrated. Price, 8 shillings net. Published by John Wright and Sons, Limited, Bristol, Eng.

A Laboratory Handbook of Bio-Chemistry By P. C. Raiment, B.A., M.R.C.S., L.R.C.P., and G. L. Peskett, B.A. 100 pages. Price, 5s. net. Published by Edward Arnold and Co., 41 Maddox St., London, W.

Physiology for Dental Students By A. G. Curzon-Miller, B.Sc., L.M.S.S.A., F.C.S. 199 pages, illustrated. Price, 10s., 6d. Published by Edward Arnold and Co., 41 Maddox St., London, W.

The History of Medicine. By Walter Libby, M.A., Ph.D. 413 pages, illustrated. Price, $2.00. Published by Houghton Mifflin Co., New York. Agents, Thos. Allen, 215 Victoria St., Toronto.

Practical Physiology By E. P. Cathcart, M.D., D.Sc., F.R.S., and others. 343 pages, illustrated. Price, 18s. net (and in two volumes, 10s. 6d. each). Published by Edward Arnold and Co., 41 Maddox St., London, W.

La Guerison de la Tuberculose Pulmonaire. By Le Dr. R. Burnand. Published by J. B. Bailliere et Fils, 19 Rue Hautefeuille, Paris.

Practical Chemical Physiology. By W. W. Taylor, M.A., D.Sc. 68 pages. Price, 4s. 6d. net. Published by Edward Arnold and Co., 41 Maddox St., London, W.

Text Book of Ophthalmology. By Hofrat Ernst Fuchs; authorized translation from the 12th German edition, completely revised and reset, with numerous additions by Alexander Duane, M.D. 955 pages with 455 illustrations. Published by J. B. Lippincott Company, 201 Unity Building, Montreal.

Diseases of the Ear, Nose and Throat. Medical and Surgical. By Wendell Christopher Phillips, M.D. Sixth revised edition, 854 pages, illustrated with 578 half-tone and other text engravings, and 37 full plates, some in colours. Price, $8.00 net. Published by F. A. Davis Company, Philadelphia.

Premature and Congenitally Diseased Infants. By Julius H. Hess, M.D. 388 pages, illustrated with 189 engravings. Price, $5.50. Published by Lea and Febiger, Philadelphia.

Manual of Diseases of the Nose and Throat. By C. G. Coakley, A.M., M.D., F.A.C.S. Sixth edition, revised and enlarged. 635 pages, with 145 engravings and 7 coloured plates. Price, $4.25. Published by Lea and Febiger, Philadelphia.

Manual of Gynaecology. By John Osborne Polak, M.Sc., M.D., F.A.C.S. Second edition, thoroughly revised. 378 pages, illustrated with 139 engravings and 10 coloured plates. Price, $4.50. Published by Lea and Febiger, Philadelphia.

Vitamines and the Choice of Food By Violet G. Plimmer and R. H. A. Plimmer, D.Sc. 154 pages, illustrated Price, $2.50. Published by Longmans, Green and Co., Toronto.

THE LONDON SCHOOL OF TROPICAL MEDICINE—(Under the auspices of His Majesty's Government) Endsleigh Gardens, Euston Road, London, N. W., England. In connection with the Hospitals of the Seamen's Hospital Society. Sessions commence 24th September, 8th January and 23rd April (approximately). For prospectus, syllabus, and other particulars apply to the Secretary, Sir James Michelli, C.M.G., Seaman's Hospital, Greenwich, S. E., England.

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Aspects of the Tuberculosis Problem.—With growing knowledge of its etiology and manifestations has come greater mastery over its ravages. The day is not far past when a diagnosis of consumption—a malady that was killing one-seventh of all people born under civilization—was equivalent to signing a death warrant. Nevertheless, the problem of meeting this enemy of mankind has been faced with resolution and with a reasonable measure of success. Sunshine, food and fresh air have had their advocates in this connection. The outcome of the various proposals, whether they concern treatment in the home or in the sanatorium, has been decidedly encouraging; yet, despite the seemingly favourable progress, there is no unanimity of opinion with regard to some of the most fundamental factors in the tuberculosis problem. An illustration is afforded by the changing views with respect to the mode of infection in tuberculosis. As Landis has recently remarked, for some years the trend of opinion was strongly in favour of the alimentary mode of infection, and many experimental studies were carried out which seemed to support this belief. Within the last few years, however, the pendulum has swung back in favour of the inhalation theory. One is probably safe in saying that infection through the intestinal tract, while accountable for some cases, is of minor importance as the portal of entry. The occurrence of primary intestinal tuberculosis is, of course, well recognized, particularly in children. Their intestinal mucous membrane seems to be especially permeable, and the infection in them appears to be due to the bovine bacillus, presumably derived from milk, which has entered through the gastro-intestinal tract. On the other hand, there are abundant statistics to indicate that pulmonary tuberculosis is almost always caused by the human type of tubercle bacillus.—*Jour. Am. Med. Assoc.*, December 30th, 1922.

Psychologic Effects of Tobacco Smoking:—Few subjects have aroused such unsatisfactory discussion as has been given to the effects of tobacco smoking. Whereas the "antis" of various sorts place the responsibility for everything from stunted growth to mental deficiency on this habit, its users praise the "delicious weed" as the most soothing of habits, and even assign it a place in medicine as a harmless sedative. Recently the department of psychology of Johns Hopkins University undertook a study of the immediate psychologic effects of tobacco smoking. Eight established psychologic tests were used to determine whether or not the smoking of cigars or cigarettes would influence the judgment and response of a number of persons to various stimuli. The results seem to indicate strongly that the immediate effect of smoking, both on smokers and non-smokers, is a lowering of the accuracy of finely co-ordinated reactions (including associative thought processes). However, against this must be set, according to D. J. Carver, who conducted the experiments, the possible decreased accuracy of the habitual smoker when he has for some hours been deprived of his customary tobacco-combustion products. There is no indication that the speed of complicated reactions is affected by smoking, nor is there indication that thoroughly mechanized reactions requiring no fine motor adjustments are affected. It is proposed to continue to experiment extensively with more refined methods and technique. Investigations by these observers and, in fact, all experiments thus far reported on this question indicate that we have no really scientific evidence on which to base a valuable opinion as to the psychologic effects of the tobacco habit.—*Jour. Amer. Med. Assoc.*, Dec. 9, 1922.

Mild Smallpox.—On more than one occasion recently, The Journal has drawn attention to the virulent trend of smallpox. The situation cannot be overemphasized, in view of the recent experience at Denver. That the remotest community is not immune, and that the cloak of mildness may hide for a time the real nature of the disease already present, is exemplified in the report of the county health officer of Biloxi, Miss., noted in *Public Health Reports*, December 29th, 1922: We have had nine cases of chickenpox reported. Chickenpox makes us think of smallpox, so I went to investigate and located a genuine case, confluent in type, resulting fatally. The victim, Dr. Fetters, a chiropractor, of Biloxi, recently from Denver, had never been vaccinated. Biloxi has had a number of mild cases of smallpox during the past few years, and some citizens are not being vaccinated as they should. A few cases like the one mentioned above would help to persuade them of the effectiveness and necessity of vaccination.—*Jour. A.M.A.*, January 6th, 1923.

The Canadian Medical Association Journal

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CANADIAN MEDICAL ASSOCIATION

Annual Meeting in Montreal—June 12th, 13th and 14th, 1923

THE plans outlined in the preliminary announcements in preceding issues of the *Journal* (December, January, February) are developing in a satisfactory way although minor changes have been found necessary.

For instance, Sir Berkeley Moynihan's address "Medicine in Art" will be delivered at an open meeting to which members, their ladies, and guests will be invited. This will necessitate departure from the decision to hold no evening sessions, and Tuesday evening, June 12th, will be devoted to this address.

The programme for the opening day, (Tuesday) will be: registration; discussions on "Infections of the Hand," and "Injuries of the Hand and Forearm;" official luncheon at 12 noon; in the afternoon a paper by W. J. Mayo, "Septic Factors in the Great Plagues;" Orthopaedic Clinic on selected illustrative cases by Sir Robert Jones, of Liverpool, and lantern slide demonstration on "Acute Osteomyelitis" by Edward Gallie, Toronto. In the evening Sir Berkeley Moynihan's address as noted above.

All the sessions of opening day will be held in the Mount Royal Hotel.

On the second day (Wednesday) the afternoon general session will be given up to papers, "Intestinal Obstruction," Sir William Taylor, Dublin; Symposium, Recent advances in the treatment of organic disease; Nephritis; Myocarditis; Pleural Infections; Diabetes and the Prostate.

In the evening the official banquet.

For the afternoon of the third day the programme is not as yet complete.

The Hospital Clinics: As announced, sectional clinics will be given in the various hospitals during the forenoons of Wednesday and Thursday as forming part of the Association programme. In addition the staffs of the hospitals have arranged to fill in the week from Monday to Saturday with a *clinical week.*

Eye, Ear, Nose, and Throat Section: The programme for this section is well advanced. Clinical sessions will be held at the Royal Victoria, Montreal General and Hotel Dieu Hospitals on Tuesday, Wednesday and Thursday respectively, whilst two other sessions will be held in the Mount Royal Hotel on Wednesday and Thursday. Dr. S. F Fraser, of the Royal Infirmary, Edinburgh, will be present, and will contribute.

CANADIAN SOCIETY OT ANAESTHETISTS

The following have consented to participate in the programme:

H. G. Barbour, Professor of Pharmacology, McGill;

W. Easson Brown, Ass't. Anaesthetist, Toronto General Hospital;

J. J. Buettner, Assoc. Prof. of Anaesthesia, Syracuse;

M. S. Dooley, Prof. of Pharmacology, Syracuse;

Robert Hammond, New York; W. B. Howell, Montreal;

T. J. Kruse, Assoc. Prof. of Pharmacology, Pittsburg;

E. C. Levine, Montreal; F H. McMechan, Avon Lake, Ohio;

W. L. Mendenhall, Prof. of Pharmacology, Boston;

R. L. Stehle, Ass't. Prof. of Pharmacology, McGill;

D. A. Warren, Hamilton.

The address of welcome will be delivered by W. W. Chipman, Prof. of Gynaecology and Obstetrics, McGill University.

ABSTRACT OF THE PRESIDENTIAL ADDRESS DELIVERED AT THE ANNUAL MEETING OF THE MANITOBA MEDICAL ASSOCIATION

T. Glen Hamilton, M.D., F.A.C.S

Winnipeg

At our annual meeting it is highly advisable that we should take stock of our organization and its affairs. A retrospect that takes brief recognition of successes and failures is essential to future welfare and progress. It is a pleasure to note that a wider interest in our Association, and a keener appreciation of its aims, and a more ready participation in its activities appears to have developed among the medical men of our province.

In January last a new Association—the Brandon and District Association—was formed, and both it, and the Northwestern and Winnipeg Associations have had a successful year. These Associations have helped to cultivate a broader, and deeper interest, and a more co-operative spirit, and have aided the activities of the Provincial Association. Moreover, we in return have been enabled on many occasions to give them aid by arranging for lectures at the Provincial Organization's expense to assist in the programmes of their local meetings. It is very desirable that the remaining districts in the province, for instance, the large area tributary to Carman and Morden, and the area tributary to Portage la Prairie and Neepawa, should be organized for a local conference during the coming year. The *Bulletin* of the Association keeps the isolated members of the profession in touch with medical affairs in the province, but the opportunity should be found of sending out a travelling clinic and a lecture demonstration such as have been reported upon so favourably in other parts of the Dominion.

Of the active practitioners in this Province, fifty-seven and a half per cent. are paid up members of the Association. This increased interest in the medical affairs of the province is gratifying to all its officers but we should like to see the percentage increased to one hundred. We were fortunate this year in having the added stimulus in interest resulting from the meeting of the Canadian Medical Association with us in Winnipeg in June. The affiliation existing between the Canadian Medical and the Provincial and Local Associations should be carefully fostered. Our Association *Bulletin*, which has been issued regularly each month throughout the year, has been sent to every practitioner in the Province irrespective of whether he was a paid-up member of the Association or not; also to every medical student of the final year; to the members of the Hospital Association, Hospital Boards and Matrons, and to the various Provincial Medical Associations in the Dominion.

You will recall that two years ago by amendment to our Constitution there was established a relationship between the College of Physicians and Surgeons and the Manitoba Medical Association in order to link together more closely the activities of the two organizations. It was also hoped at that time to secure several amendments to the Medical Act, which would bring the Council of the College of Physicians and Surgeons closer to the electorate and make it more responsive to its wishes. Several amendments to our antiquated Medical Act are surely needed. More frequent elections to the College of Physicians and Surgeons should be held. If the appointments to the Council were for two years instead of three years, interest would be stimulated and a continuity of policy assured by electing half their number every year. Again, the ratio of representation is ill-proportioned; for North Winnipeg has thirty-nine practitioners, Centre Winnipeg fifty-nine, South Winnipeg two hundred and seven, yet each of these groups is represented by three members in the Council. The liberty of the College of Physicians and Surgeons' Council in making expenditure of funds is altogether too restricted by the present Medical Act. The Manitoba Medical Association has had to assume and pay for several activities which were decidedly the business of the whole profession. Why should not the Treasurer of the College of Physicians and Surgeons be enabled legally to assume certain liabilities since its funds virtually belong to the whole profession? If the Manitoba Medical Association were relieved in this way the annual fee could be reduced.

Another matter for serious consideration in amending the Medical Act is the question of the annual compulsory registration of all practitioners. The Medical Act excludes as ineligible for election to the Council of the College of Physicians and Surgeons all members who belong to the faculty of the Medical College. Since the merging of the Medical College with the University, it does not seem reasonable that any such barrier should be kept up. The College of Physicians and Surgeons in their Council should become more like a House of Commons reflecting the various opinions of medical men and less like a Senate removed from the movements of popular opinion.

You will recall that at the last session of the legislature it was expected that another attempt would be made to license irregular practitioners. We passed resolutions relative to this matter at our last annual meeting and a "follow-up" committee was appointed. This committee prepared and issued a brochure containing resolutions. It was entitled "Medical Licensure," and five thousand copies were printed, and carefully distributed to representative and responsible people throughout the province. As the Provincial Legislature was dissolved before the matter came up for final consideration, our actual position was not revealed, although we know the pamphlet was well received and the general effect was excellent. While we have reason for confidence in the integrity and good judgment of the members of the new government, we must assist them as far as possible in keeping the people of this province free from the iniquitous state of affairs, which has developed elsewhere through the ignorance or failure of some legislators.

We have noted that, as a natural reaction resulting from the scarcity of trained medical men in various parts of the country, some people have expressed the opinion that they would insist on a lower grade of training for medical graduates. They think that by this means they could fill up the professional ranks. They would go further and admit the so-called "graduates" of cults and quackeries to whom a world famous surgeon referred a few days ago in an American paper as; "graduates who in a few months acquire a jargon and by blatant salesmarship sell to an unprotected but willing public."

It is rare that legislation far in advance of the public intelligence can be secured. The application to the individual, or to the community, of principles of health founded on recent discovery is likewise frequently difficult. Military discipline during the war, made possible the prompt application of many scientific methods. A very few months showed their wonderful economical value to life and health. Inoculation against typhoid may be taken as an instance of such a public health measure. The public must be educated. One hundred and twenty-five years have passed since Jenner made his discovery and still the value of vaccination against smallpox is denied by many. The public should be told that in Manilla alone the death rate of six thousand per year was reduced to zero twelve months after the introduction of vaccination.

Our Association has made a beginning in the matter of telling the public something about medical matters by holding popular lectures at the provincial and local meetings. Also a number of medical articles have been written, and have appeared in the more important papers. I would draw your attention to the fact that during the past year the requests for popular lectures on the occasion of medical conventions were hard to meet. It is one of the shortcomings of our profession that too few of our men have equipped themselves for lecturing whether in a technical or in a popular way. A much larger number of our members should prepare addresses, which would be ready for delivery as part of a programme or as a separate lecture on short notice. It has been suggested in the matter of newspaper articles that probably short paragraphs would prove of greater value than longer and more technical essays. In a medical educational campaign a press committee could be found to write short and aptly-expressed paragraphs, and to feed these to the newspapers of the province. Much can be achieved in this way, and only by this method will our people secure that grasp of medical science which will enable them to appreciate the benefits it holds for them in the prevention and treatment of disease. Then the hollow and sophisticated claims of quackery will not attract them. It is said that three-fourths of the sorrows of men are due to apprehension. We know that many diseases are self-limited and cure themselves. Cults, quackeries, and patent medicines have their triumphs in the relief of apprehension, and take credit for the relief of self-curing diseases. Lying in the wake of quacks, however, are cases of hopelessly delayed cancer, tuberculosis, and organic diseases—the wreckage of human life. We must put forward an earnest and self-denying effort to educate the public in popular medical science.

While our medical practice should not be considered as a commercial enterprise, we are undoubtedly lacking in those business principles which every other line of activity has found essential. I would go further and say that not only have we been negligent in not giving due attention to the matter of informing the public, but we have been so negligent that already many duties which ordinarily should be performed or overseen by the medical profession—duties analogous to those assumed by commercial and industrial concerns—have been entirely ignored by us and left to the public. In consequence of our failure, insurance companies, philanthropic and other public-spirited bodies have, in a large measure, supplied the little that hitherto has been given of medical enlightenment to the public.

Lord Dawson in a recent address has pointed out that physicians must become psychologists and study the mental as well as the physical aspects of disease. The unending line of pseudo-scientists has all too readily grasped this idea. So long as we persist in treating the neurotic with an unsympathetic and jocular attitude, just so long "irregulars" will continue to flourish. The time is fast approaching when the action of the sub-conscious mind upon the bodily functions must receive more attention from our leading scientists. Science may yet find that faith can, and does at times, assist in removing the mountains of pain and distress.

During the year that has passed the code of ethics of the medical profession of Canada was revised. A considerable amount of unnecessary material existing in the former code has been cleared away. While the spirit remains the same, its expression and arrangements have been brought more into line with the conditions and problems of practice to-day. Restoration to our former status, from which we as a profession have been definitely lowered in the eyes of the public by the actions of a few, will be recovered by an observance of ethical principles rather than by disciplinary measures. We have to consider seriously what tests and certificates of moral character should be demanded to enable one to enter upon the study of medicine or to continue in its practice.

RECENT CANCER THERAPY*

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THIS is Cancer Week. Its very existence represents an undertaking by the members of the medical profession and their allies among the lay public of far greater importance than is generally recognized. Too often we fight our battles single-handed. Too often the plain people point out that a profession is likely to become bound by rules and regulations so that its efficiency is hampered and it cannot accomplish what is of the utmost value for its own purposes, for many of the important reforms of the profession have come from those who were not its members. Cancer Week illustrates extremely well the admirable combination of these two forces. Its importance cannot be overestimated. yet its advent has been greeted in some quarters with half hearted approval or even open criticism. I do not refer in this to the ravings of the quacks whose business is being damaged by publicity, but I mean that well-intending members of the medical profession have remarked both in print and in private that the campaign of the Society for the Control of Cancer was scaring people, apparently oblivious of the fact that it is better to be scared than to be dead of cancer, and also apparently oblivious of one other important thing, and that is, that at present by any means of treatment we reach only a minute fraction of the sufferers from cancer because they come too late. Since concrete examples are always useful, I inquired some time ago in a surgical conference in my own hospital as to the number of cases entering the institution for surgical treatment in whom the disease had advanced so little that a permanent cure could be expected. At first the surgeons were inclined to think that a considerable proportion of cancer patients admitted were easily operable with promise of good results, but on a careful survey of some 700 cases of cancer entering during the past two years and a half, it was found that the proportion was extremely small. Including the views of the most optimistic, the percentage of easily operable cases was not over twenty. Many of the presumably operable group, however, were found during the course of the operation to offer no prospect of permanent cure. Extensions of the growth, which had not been demonstrable when the clinical examination was made, were found upon exploration. Probably a conservative estimate would be that not over ten per cent. of the cases entering a general hospital in a very intelligent community are operable, and of these the larger proportion die ultimately of a recurrence, so of those entering such an institution I believe it is safe to say that hardly five per cent. are cured even by the highest skill in diagnosis and treatment which the medical profession can offer to-day.

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In hospitals in which the material is largely from the more unintelligent classes especially among recent immigrants, where ignorance of the symptoms of the disease is complete, the number of patients who are operable often falls below one per cent. To these advanced and inoperable cases, radium and x-ray offer only amelioration, and only in rarest instances has a cure of five years' duration been produced, and this chiefly in epidermal carcinoma or in that of the cervix. These facts are not due to inefficiency in the medical profession itself, although it is true that there is still too much hesitation in making a definite diagnosis and urging the patient to consent to operative treatment. Many of the older practitioners are apt to watch a tumour grow, to wait until the diagnosis is completed by the appearance of the classic textbook description of cancer. In most instances the patient then is inoperable. It is indeed difficult to tell a person in apparently perfect health that he must immediately submit to a mutilating operation, and many people suffering from small early tumours cannot be convinced of the necessity for such a procedure. Even the surgeon himself is sometimes to blame for a dilatory attitude towards the treatment of cancer. It is too often forgotten that every moment a cancer exists in the body increases the liability of a metastasis to a distance; that the only time to operate on a cancer is as soon as it is found, and that it is better to do a few unnecessary explorations in order to attack the disease at a period when it is curable, than to delay till the diagnosis is easy. It has been known for 2,000 years that only early cancer is curable. But most of the responsibility for the high death rate from cancer which is carrying off at least 90,000 people in the United States, and 10,000 in Canada does not lie at the door of the medical profession. It is due to the gross ignorance of a large part of the population concerning the nature of the disease; they do not know that cancer is a painless disease, one without symptoms until it is fairly advanced, and that the only method of accomplishing satisfactory results is to so educate people that they will consult a physician in the early stages of the disease. It has been estimated that 20,000 people in the United States and 2,000 in Canada could be saved annually if they would promptly apply for the surgical removal of early carcinomata of the skin, the lip, the tongue and the breast; all tumours which can be felt or seen. It is, and will always continue to be, a herculean task to overcome the indifference of people toward obtaining a diagnosis in a disease which is painless and causes no symptoms. No one with a toothache delays very long in seeing a dentist, and yet no one ever died of toothache. No person with pneumonia procrastinates in obtaining help from the nearest physician, and yet every one of us sees patients who have delayed months and years with a cancer which from their own description must have been completely and easily removable at some period during its course.

In addition to this popular inertia, we have to combat the pernicious activities of those potential murderers—the quacks—who, both in and outside of the profession, by their seductive statements concerning the cure of cancer by sera, by diet, by salves, and other simple methods induce many people to try such procedures until the disease has reached a point where it is hopeless. The more the medical profession attempts to instill the necessary knowledge into the public, the more these people advertise their wares. By featuring the unpleasant and mutilating aspects of surgery they attempt to push forward their own treatment merely for the abstraction of money from the unfortunates with whom they deal. They call attention to the fact that the recorded death-rate from cancer is increasing, and draw from this the unjustifiable conclusion that surgery is a failure. Some of them pretend to join with us in propaganda in order that they may fasten their clutches upon the unfortunate who do not know the difference between a good physician and a bad. They propound weird theories concerning the causation of cancer in order to devise and market drugs, sera, or vaccines, which if the theory be accepted have some hypothetical value. The only answer is unwearying effort in placing before the public the true facts concerning the disease. Authoritative statements must be issued by the leaders in our profession and spread broadcast either through the press or in pamphlet form to reach those whose only medical information is obtained from the handbills of the quack. It is perhaps a disheartening and disillusioning work, it requires sacrifice of time and a disregard of some of the rules hitherto held as essential to the ethical health of the profession; it will have to be continued year after year because a new generation arises which needs education, but remember, it will result in the saving of many lives. One of the first results of a nation-wide propaganda will be an increase in the recorded deaths from cancer, because attention will be directed both by the public and by the physician to the frequency of the disease, thus more correct diagnoses will be made and reported in the death-rate statistics. This, of course, will give the quacks additional ammunition, but will also be the best demonstration of the effectiveness of the efforts of the American Society for the Control of Cancer. A fall in the death-rate will only occur when an immensely greater number of people apply early for surgical treatment.

The real justification of a Cancer Week lies in the well known law of crowd psychology that a campaign of information can only be put over by inciting enthusiasm and special efforts over a short period. It is not only difficult to be enthusiastic all the year around, but it is far more difficult to interest people for that period; yet by concentrating our efforts on obtaining all possible publicity, and by freely discussing all of our questions during one week in the year, we can make an impression which we never could by diluting our energies throughout a longer period. And while in Cancer Week our chief efforts are to be toward the education of the laity, it is also an admirable time for us to clarify our views concerning the best methods of treatment, and their value from a medical point of view, and this is my theme to-night.

The greatly increased interest in the treatment of cancer is not entirely due to the fact that the recorded frequency of the disease shows a great increase. Another factor has played an important rôle, and that is the natural aversion of patients to surgical operations. This has not only rendered them always an easy prey for the quacks who promise "a cure without the knife," but has caused far more public interest in the radiation therapy of cancer than the results would otherwise have warranted. The dramatic circumstances which surrounded the discovery of radium and the extraordinary phenomena which accompany its disintegration and its biological action on the tissues, afford an easy explanation for the widespread interest in what the French call "Curietherapy" of cancer. This interest has been fostered by emotional and uncritical workers in the field, who have made statements which, to put it gently, are optimistic. Those who have radium to sell naturally have not been slow to seize the opportunity to use modern methods of publicity in the disposal of their goods, and in this field they have been cordially seconded by the newspapers, who feature all the spectacular results and omit to publish the fatalities. The radium enthusiasm has now about run its course. The price has fallen more than a third, owing to a variety of causes, one of which is a buyers' strike. No physician wants to sink a large portion of his capital in the purchase of a substance which, it is now realized, has only limited capacities in the most frequent types of tumours which he encounters, that is, the tumours of the gastrointestinal tract. The dermatologist will always have need of a moderate quantity of radium in order to treat with comfort and facility certain of the superficial, semi-benign tumours of the basal cell type. Gynaecologists will always need a few hundred milligrammes to palliate inoperable cases of carcinoma of the cervix, and those institutions whose endowment permits will unquestionably employ large quantities of radium in the form of emanation needles in the palliative treatment of many inoperable tumours. But the high optimism of the past few years is being replaced by an extreme and unjust pessimism. Although radium may not cure many patients with cancer, it is to-day a most valuable adjuvant to surgery and a useful palliative in inoperable cancer. What its future accomplishments may be is futile to attempt to prophecy.

But the surgeon who has in his possession some $5,000 worth of radium, bought in a moment of enthusiasm, is now gladly selling the substance at half the amount paid for it, for he has found that the insertion of this quantity into a rectal tumour may produce tenesmus, but it does not cure the cancer, and that there are few fields, except that of dermatology, in which fifty milligrammes of radium have any real value.

With the waning of radium enthusiasm there has come a new wave, chiefly dependent upon propaganda from some German clinics, concerning the extraordinary effectiveness of x-rays especially such x-rays as are produced by machines delivering currents of voltages in excess of 200,000. The sober and more experienced operators, both in Germany and in this country, have been slow to accept the fantastic claims of a few of the German clinics. I have been able to show by experiments on mouse tumours that the killing of a neoplasm by x-ray is not a function of the voltage, but all tumours are killed by the same multiple of a skin erythema dose, which is the limiting factor in the treatment of human beings. The only advantage then of high voltage x ray is the greater penetration which the short wave lengths produce in the tissues and the greater amount of scattering of the rays which plays an important part in the dose received by the deeper structures. The points of superiority therefore lie in physical reasons, not in biological ones, nor was any other effect to be expected, for if radium has not worked miracles, why should the x-ray produced at lower voltages than the radium or gamma rays accomplish them. While there are therefore sound physical reasons for the employment of voltages of 200,000 and over, there are many practical difficulties in the way of the effective use of such machines, the chief of which is the short life of x-ray tubes running under these conditions. Indeed, the tube replacements become so excessive that the cost of radiation with a high power x-ray machine is approaching that of treatment with radium. This factor is making itself felt even in those clinics abroad in which the use of higher voltages was first advocated, and private information from a number of sources has reached me that many of the operators are now using not to exceed 180,000 volts in order to obtain a reasonable tube life, and thus avoid excessive overhead charges.

But to return to our patients. All the radiation publicity has resulted in one unfortunate situation. As soon as a diagnosis has been made of a malignant growth, patients with operable growths often insist that radium or x-ray be given, and many nowadays are refusing surgery even when frankly told that the results of radiation are far less certain than complete removal.

The surgery of borderline cancer is indeed a difficult question, and requires great knowledge of anatomy, a knowledge of the most frequent distribution of tumour particles through the lymph channels of the operative field, a willingness to spend hours in prolonged dissection, and often a full appreciation of the fact that with the utmost efforts the results may turn out to be disappointing in the end. It is a temptation, therefore, to refer such borderline cases to the radiotherapeutist in the hope that he can accomplish something which the knife will not. Unfortunately hope never cured a cancer.

A satisfactory analysis of the surgery-radiation situation requires a certain amount of classification of types of neoplasm and their regional distribution. In my belief, with the exception of the basal cell tumours of the skin, all easily operable carcinomata should be removed by the knife or some form of cautery. All inoperable cases should immediately be transferred to the most competent radiotherapeutist within reach, to be treated as he sees best. In passing, it may be said that it is wiser for the surgeon not to tell the patients too much about a method of therapy, the details of which he may be ignorant. I have seen many a patient terrified and avoid post-operative treatment for months on being told by the surgeon that their x-ray exposure would be four or five hours in length, and that they would suffer from nausea and vomiting and collapse for weeks with probably a transfusion at the end to prevent death, he having extracted this information from a couple of recent German articles on the subject. As a matter of fact, when some of these patients did reach the x-ray clinic they were in such a condition that long raying would have been criminal and useless. The administration of a large dose would merely have added another fatality to the hospital records. Patients with advanced cachexia, with tumours which have involved blood vessels or vital organs should not be submitted to radiation. It only hastens their death, or if radiation is given, it should be very small in amount. Extensive bone metastases usually are a contraindication to heavy radiation. Small doses relieve pain and comfort the patient, but large doses are apt to damage the already severely compromised bone marrow. Operation then for the operable and radiation for the inoperable.

What then should be done with the great group of borderline cases? This important question may not be settled for many years. If radium or the ultimate ultra powerful x-ray apparatus ever show that they can produce a certain number of cures in borderline cases surgery should cry "hands off," because operative procedure under such circumstances is too often unsatisfactory. In the present state of our knowledge, my opinion is that the question has to be answered individually and entirely by the situation and nature of the growth, and by the facilities which exist for treatment. If the surgeon is extremely competent, it would be wise for him to do as much as he can, trusting to post-operative raying to hold any of the tumour in check. But poor x-ray is worse almost than poor surgery for it stimulates the tumour to more active growth. In tumours of the gastrointestinal tract palliative surgery is far more important than radiation. Everyone has seen patients with carcinoma of the rectum go for years after a colostomy. Such tumours are but little affected by radiation or even by the insertion of radium needles. The tumour is often reduced in size and excellent palliative results obtained, but a cure cannot be expected. Carcinoma of the stomach is the most unsatisfactory field for radiation therapy. In my opinion gastroenterostomy in a borderline case is far better than radiation. In fact, I question whether radiation, even post-operative, of a stomach carcinoma, is justifiable. The close proximity of important and sensitive organs renders raying impossible in many instances. The nausea and vomiting prevent the patient from recovering his nutrition after the operation, and I believe that in most instances radiation treatment hastens the death of a patient with a gastric carcinoma. In borderline carcinoma of the breast I personally believe that the best results are obtained by as extensive surgery as is possible, followed by very heavy post-operative raying, the treatments being given in small series of four or five exposures, with considerable periods of rest between in order that the patient may recuperate from radiation anaemia and other depressing effects of the raying. The periods of radiation with gradually increasing intervals should be employed for at least a year and preferably two if the patient will consent. I have never seen a skin recurrence in any patient after removal of a carcinoma of the breast in whom satisfactory radiation therapy had been employed. Those patients who have shown local recurrences have been of the highly neurotic type in whom it is impossible to give sufficient doses of radiation. They are so upset and nauseated by even moderate doses of x-ray that it is impossible to give them treatment. When the tumour has returned locally, especially if it is attached to the bone of the sternum or ribs, the problem is far more difficult, and I doubt if any patient will survive such invasion. The tumour may be held in abeyance for a considerable period, but sooner or later involvement of internal organs takes place, and the end is not far distant. Mediastinal metastases are of course incurable. It is impossible for the patient to survive the necessary dose required to destroy cancer in the depths of the thorax, but all of these people should be treated by x-ray, for often an astonishing amount of comfort and apparent prolongation of life is obtained, even in those whose pleural involvement is demonstrated by the presence of a recurring haemorrhagic exudate. The fluid should be drawn off, and the radiation begun again as soon as the patient's strength is sufficient. The cough is often relieved greatly by radiation, and I am sure that life is prolonged for a considerable time under more comfortable circumstances than if nothing is done.

Another group of carcinomata which are always inoperable or borderline are those of the bladder and the prostate. Squier has reported an extraordinary series of carcinoma of the bladder with some thirty per cent. cures at the end of three years. This high figure is probably only an example of what can be accomplished by extreme skill and specialization and will hardly be duplicated by the general surgeon. If there is no obstruction I think the bladder tumours should be destroyed as far as possible by the high frequency spark, and the patient then subjected to heavy radiation with x-ray without opening the bladder. I had some extremely satisfactory results under these circumstances. If there is obstruction, a suprapubic cystotomy should be done and as much of the tumour removed as possible by any suitable means, and radium needles inserted into the base. A sharp cystitis is inevitable, but good palliation is obtainable in a small proportion of instances.

In carcinoma of the prostate, in which obstruction is not present, I have had some extraordinarily satisfactory results by repeated radiation without opening the bladder. Some of my patients are still symptom-free at the end of a year, although when their radiation was begun they were in a very serious condition. They gained in weight, and have gone back to their occupations apparently in full health. How long this condition will continue I have no means of telling. Some of these carcinomata, however, do badly from the start, and nothing can be gained by radiation in any form. If obstruction is present of course cystotomy has to be done. Whether better palliation is obtained by the insertion of a moderate amount of radium in the form of screened needles, or whether it is better to ray these patients with high voltage x-ray, I am not prepared to state. Those who use radium are still at variance as to the best technique, and freely acknowledge that no cures have been obtained. On the other hand, I have seen excellent palliation by the use of x-ray alone. As a rule, the patient suffers less from the x-ray than from the radium. The latter is apt to cause a good deal of tenesmus and bladder inflammation which does not accompany the use of penetrating x-ray.

The borderline and inoperable carcinomata of the oral cavity are best treated with radium in the form of needles. X-ray fails here because of the mobility of the part, and the difficulty of applying a sufficient dose to produce an appreciable effect. Most of these tumours are highly resistant to radiation and require a large number of erythema doses to kill any portion of them. This obviously necessitates the use of embedded radiant material. Much better effects are obtained by not attempting to do too much. A good many patients have been treated with overdoses of radium or x-ray in order to attempt a cure. It is better to frankly acknowledge that they cannot be cured, and that only a sufficient amount of radium be inserted to cause shrinkage and regression of most of the tumour. In these oral carcinomata the lymph-nodes of the neck should be removed, whether they are apparently involved or not, for this prolongs the life of the patient. When the cervical nodes are involved the tumor particles which they contain cannot be destroyed by radiation.

The treatment of the bone sarcomata is still a matter of discussion upon which we will have to learn much more than we now know before the final determination of the proper method of treatment is obtained. Some of the German operators are inclined to recommend x-ray; others feel strongly that surgery should be the method of choice in all operable cases. Much confusion has arisen because of the inability of the pathologist to determine from the microscopic picture the degree of malignancy of the tumour. Some of the bone tumours are apparently more nearly related to inflammatory processes than to the true neoplasms. Some of them can be cured by local excision, and these need nothing but post-operative raying with x-ray in order to keep down any return. Other tumours of almost exactly similar microscopic morphology are malignant and capable of metastasizing to distant organs. These should be treated by a high amputation whenever possible, but obviously the lungs should first be demonstrated to be free of metastases. I say this with full knowledge of the fact that the reports of the Codman Committee have shown that astonishingly few cases of bone sarcoma have been permanently cured by surgery. But if they have not been cured by surgery, neither can they be cured by radiation, for this group, especially the osteo- or chondrosarcomata, are so highly resistant to any form of radiation that their growth is as often stimulated as it is inhibited even by large quantities of inserted radium or by intense high voltage x-ray.

A rare group, related to the myelomata, and described by Ewing as endotheliomata, seem to be susceptible to radiation, but as these tumours are frequently multiple, radiation is useless unless it can be shown that only a single focus exists. The lymphosarcomata are described in the textbooks as extremely susceptible to radiation. In many instances they are, and a few reported cases of five years' cures can be found in the literature. This means that the tumour was entirely confined to one area. The multiple cases are, of course, hopeless, though the dyspnoea due to intrathoracic pressure can often be removed and the patients kept in fair health for a year or two by continuous raying. Some patients however do badly from the first; the tumours are not at all susceptible, and no benefit is obtainable by even the most intensive radiation. Some of the lymphosarcomata of the intestine yield in a very satisfactory manner and the life of the patient is unquestionably prolonged; others do very unsatisfactorily, and but little is gained by treatment. The microscopic appearance of the tumour offers no clue as to its biology, as growths of exactly similar morphology behave in an entirely different way under radiation.

Pre-operative raying in operable cases and in borderline types has been much discussed, and is being widely tried out. I do not personally believe in it, for the reason that if any dose sufficient to affect any proportion of the cancer cells is given, the skin is necessarily damaged, for every radiotherapeutist knows that to affect such subcutaneous nodules a dose of at least an erythema must be given. An erythema dose, however, often prevents full healing of the operative field, and therefore, in my opinion, should not be employed. In certain regions I have tried heavy pre-operative raying over circumscribed tumours, with the idea that it might be possible to sterilize the neoplastic cells. The operation must be done within a short time, not to exceed forty-eight hours after the exposure, and the skin over the radiated area excised. Such treatment is very rarely possible in any situation except in small tumours of the breast and those without extensive glandular involvement, for the glands of the axilla cannot be radiated sufficiently to do them any damage; otherwise healing will not occur at all in this region. But if the tumour is small, and in the centre of the breast, the area should be marked off with silver nitrate, through which five or six skin erythema doses can be given. In no other site, in my opinion, is pre-operative raying justifiable.

On the other hand I believe in thorough post-operative exposures with x-ray in all instances. Experimental work on animals has shown that small metastatic or inoculated growths are very much more susceptible to radiation than the primary tumour. Therefore while we should not ray operable primary tumours, it is reasonable to assume that tumour cells left in the tissues may be destroyed before they have a chance to grow to any extent. This should be done with high voltages and heavy filtration with copper or zinc to get full penetration to the layers under the skin. It should be repeated, as I have described for a carcinoma of the breast, for a year or more, until chance of local recurrence is reduced to a minimum. Such post-operative radiation is most effective in cancer of the breast. It can, however, be applied in tumours elsewhere, as, for example, the bladder, the neck, all skin tumours after excision, sarcomata, both of the subcutaneous tissues and of the bone. The regional glands in the groin or the retroperitoneal region should be rayed after the excision of testicular tumours or sarcomata of the extremities. While melanosarcomata are, as a rule, extremely resistant to radiation, I have seen some astonishing results, one case now being alive four years after operation, though a few melanotic tumours reappeared within the first year. These disappeared under radiation, and the patient is at present in good health. This, however, is extremely exceptional, and most melanomata are hopeless. In this connection I should like to state that pigmented moles in any part of the body which are subject to irritation should be removed and removed by wide excision. They should never be treated by radium or x-ray, nor by caustics, freezing, or the cautery. Such procedures seem to start up malignant processes in hitherto quiescent moles, with rapid and hopeless involvement of the internal organs.

The rare mixed tumours of the parotid, if they do not contain cartilage, and have not yet developed sarcoma or carcinoma, are fairly sensitive to radiation, but if they can be removed without damage to the facial nerve, it is wiser to excise them and then ray afterward prophylactically. Cases in which excision implies serious damage to the face may be rayed for a time; then if they do not yield surgery must step in.

Some interesting results have been seen in the post-operative treatment of papillary adenocarcinomata of the ovary, whose exact malignancy is still somewhat in question, but I have seen a number of patients who have been free from symptoms for a long time following the use of large doses of x-ray. Other patients whose tumours presented a similar morphology died within a few months with extensive peritoneal involvement, despite radiation.

Carcinoma of the cervix is a field in which possibly radiation may compete with surgery. At the present time the most competent surgeons believe that the operable cases should be operated upon, but I think that the borderline types, and of course all of the inoperable cases, should be treated by radium. Astonishing palliative effects are obtained, and a few advanced cases have gone four or five years after radium treatment without a recurrence. This is unquestionably due to the favourable anatomical situation of the uterus, which permits the insertion of large quantities of radium into the body of the organ without much damage to the surrounding tissue. Needles also can be placed in the cervix with very excellent effect. Accidents, of course, occur, such as perforation of the neighbouring intestine with fatal peritonitis, or by the production of vesicorectal fistulae. Where the bladder or rectal septum is involved, the case is usually hopeless and large doses should not be given in order to avoid the production of a fistula. The treatment should be done in a single sitting, and not repeated. If radium is again inserted after a few months, the scar tissue which has been produced by the first radiation is so poorly nourished that serious sloughing, prolonged ulceration, and a fistula is often the result.

Carcinoma of the body of the uterus should be treated by hysterectomy, as the results are extremely good, the tumours apparently being of a low grade of malignancy, and their metastatic involvement of the surounding viscera being very late in occurrence.

The only other field where radium competes with surgery is in the basal-cell tumours of the skin. These often yield to doses not in excess of an erythema, and most of the small tumours can be permanently cured by a single application of a single dose of either x-ray or radium. About ten per cent. of these tumours however contain squamous cells and it is wise when in doubt to excise a piece of the tumour before beginning treatment. If squamous cells are present the dose must be at least double that of a simple type of basal-cell epithelioma, and excision is wiser as the tumours are extremely apt to recur. When a recurrence takes place after radiation it is very insusceptible to further treatment of the same type.

To sum up: Operation in all operable malignant growths. To treat such a growth by radiation methods assumes that we knew the exact amount of such radiation necessary to kill all of the cancer cells. This we positively do not know at the present time for human tumours. The assumption that if a part of the tumour is killed by radiation that the body cells will destroy the rest is pure phantasy, and has not the slightest foundation, either in clinical observation or in experimental work. If the body tissues had any power to destroy carcinoma cells, a malignant tumour would be destroyed in its inception, and the fact it is not, is a definite proof of the lack of any such protective capacity. In borderline and doubtful cases, a combination of radiation and surgery is often the most effective. The type of radiation to be used depends upon the site of the tumour, the extent and nature of the surgery also upon the same factor. Inoperable carcinoma should be treated with radium if small and fairly well localized; if extensive, should be treated by x-ray. Operation is perfectly useless and tends to make the patient worse rather than better. In many cases no palliative effect is obtained by any form of radiation. In others fortunately the tumours seem to be of low biological resistance, and remarkable palliative effects are obtainable, which may last for a considerable period of years, accomplishing a result in a condition before which surgery is powerless.

The hope of making extensive inroads into the death-rate of cancer lies therefore in publicity, to bring the patients early to the surgeon. The task of the surgeon is to improve his technique and extend his operative field so that all of the tumour can be removed as promptly as possible. If this cannot be accomplished, we have in radiation therapy an extraordinary palliative method, which prolongs life and adds to the comfort of the patient. If no cures were ever obtained by either radium or x-ray, their use would be justifiable on account of the extraordinarily valuable palliation which they often offer, and which exceeds that obtained by any other method.

The Significance of Lymphatic Involvement in Infections.—Particular attention is directed by William J. Mayo, Rochester, Minn., to the fact that not all enlarged glands associated with cancer, especially in septic situations, such as the gastro-intestinal tract, are due to cancer. The glands may enlarge if a benign lesion, such as a chronic ulcer, precedes the cancerous change. Chronic sepsis involving the glands is not infrequent; the glands may become so extremely hard as to appear malignant. This condition is quite constant in cancer of the large intestine. Postmortems show that half the patients who die from cancer of the colon have no cancerous involvement of the lymphatic glands at the time of death, although the glands may be greatly enlarged from sepsis. I mention this because I have operated on many patients whose condition following exploration has been pronounced inoperable on account of glandular involvement, and I have been able to resect and definitely to show that the glands were septic, not cancerous. These patients have remained well for long periods. Microscopic examination of the glands will be necessary in many cases to decide the question.—*Jour. Am. Med. Ass.*, Jan. 27, 1923.

THE CONTROL OF CANCER*

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THE American Society for the Control of Cancer was formed in 1913. The main object of the Society has been to educate the public concerning cancer and to impress upon them the fact that it is a curable disease if proper treatment is undertaken early enough. There is no disease which has been studied more intensely as to etiology, pathology, clinical course, and treatment than cancer. All authorities agree unreservedly that cure may be effected if the disease is removed by surgical means at a sufficiently early stage in its course. Speaking of cancer of the breast in a recent article, that veteran surgeon, Dr. W. W. Keen, of Philadelphia, makes the following statement as the result of his long, varied, and extensive experience. He says,—"If every woman who found a lump in her breast would consult a surgeon at once—that is to say within forty-eight hours, if possible, but in any case within a week—I am sure that eighty-five out of every one hundred, and it might well be ninety out of every one hundred, would *be* cured and *stay* cured. So cancer is curable—provided you consult a good surgeon *at once*. Remember that, when you find a lump already formed, the disease has been at work for weeks, and it may be for three or four months, before a discoverable lump has been formed." Over against this statement by Dr. Keen we may place in contrast the published end results of authors who have studied a very extensive series of cases and who cannot claim a larger number of cures than from thirty-five to thirty-seven per cent. of the patients who come to the surgeon to-day for treatment. The conclusion is obvious, namely, that patients do not reach the surgeon early enough and that by far the best prospect of controlling cancer and saving life, sacrificed to-day unnecessarily, is by bringing the people who are victims of this dread disease under skilled treatment at the earliest possible stage of its development.

Statisticians show us that one out of every ten persons over forty years of age die of cancer. Many of these deaths are preventible and will be prevented if our efforts are successful in persuading the victims of cancer to seek professional advice early. It is therefore incumbent upon us to encourage the dissemination of exact knowledge among the laity dealing with the facts regarding cancer. The public should be taught that cancer is curable but that cure in the vast majority of cases is dependent upon the employment of suitable treatment at a very early stage in the progress of the disease.

The work of the American Society for the Control of Cancer is to be commended. Under the direction of its able President, Dr. Charles A. Powers, of Denver, it is performing a task which will undoubtedly prove of great service in the community. For the campaign of 1923 this Society is expending $60,000. The fight against cancer, inaugurated by the society in the United States has been extended to embrace Canada and more recently Great Britain. Last year there was instituted "Cancer Week" when, in an intensive fashion, a special effort was made to instruct the public. The Annual report showed that in the United States and Canada 500,000 people heard lectures and 5,000,000 pieces of literature were distributed during cancer week. Various clubs and fraternities had special addresses and the lay press devoted much space to the subject and thus assisted very greatly in the life-saving work. Cancer week for 1923 begins on November 12th and, it is believed, much more systematic and much more extensive work will be done than was accomplished last year. It is hoped that all over this Continent and in Great Britain valuable service may be rendered the public and many victims of cancer, over this wide area, may be saved, by this agency, from the ravages of this dread disease. A special meeting of the Academy of Medicine, Toronto, is convened during this week for the special study of cancer: addresses are being made before various clubs such as the Canadian Club, the Empire Club, the Kiwanis Club, etc., the local Press are devoting a considerable amount of space to the subject and it is thus hoped that we may be doing our share in work which must be considered of great national importance.

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*Read before a special meeting of the Academy of Medicine, Toronto, November 14th, 1922.

The responsibility of the Press in this matter cannot be overestimated. The whole-hearted desire of the Press to assist in such a campaign is demonstrated by their ready response to a request for space to publish articles dealing with the subject. On the other hand, beyond the slightest doubt, the most powerful agency today in frustrating our efforts to control cancer is the advertisement of quack remedies and the exploitation of so-called "cancer-cures" in our daily press. These publications lead to a loss of human life by cancer which is preventible. We in the medical profession should unite in a combined effort to convince the lay press of their grave responsibility. In many instances valuable lives are sacrificed as the direct result of articles appearing in our daily papers. The evidence is overwhelming to show that the greatest advance in the treatment of cancer in the last decade is found in the improved methods for the early recognition of the disease and in the immediate removal of the cancer growth by surgical operation. On the other hand the most powerful agency to frustrate our efforts in this regard and to lose time, so vital for the individual, is found in the articles and advertisements of remedies which are not only ineffective in the attempt to eradicate cancer but may actually stimulate the disease to increased activity. The unfortunate victim of such press propaganda is lulled into a fool's paradise, eagerly laying hold of the plausible promises of relief, they subject themselves to treatment which does not cure, they suffer unnecessary pain and anxiety and finally when surgical advice is sought it is too late because the disease has now progressed beyond the limit which makes it possible to save life. Let us therefore appeal to the press to aid us in our endeavour to advance medical science in this regard.

There can be no doubt of the fact that patients suffering from cancer are brought under treatment at an earlier stage than formerly. Recently I read a paper upon cancer of the breast and I had occasion to compare my statistics published in a paper ten years ago with those compiled for my cases of the last decade. The comparative study showed a very marked improvement in this regard in my recent series as compared with the former series of cases. This is indicated in the following table:

AVERAGE DURATION OF DISEASE AT TIME OF OPERATION

Malignant Growths	*Old Series*	*New Series*
Average Duration....	14.375 months	12.75 months
Those who came to operation under one year...........	54.5%	76.8%
Those who came to operation under six months.........	35.4%	53.6%
Those who came to operation under three months........	19.0%	37.5%
Those who came to operation one month and under one month from initial symptoms....................	8.4%	27. %

Many of us can remember a time when a practitioner would wait for what he termed "certain signs of malignancy" in a breast before a surgeon was consulted: these signs would consist of a growing tumour with palpable axillary glands, retracted nipple, adherent skin, etc. Now practitioners are on the alert to detect the earliest possible signs of malignancy not only in the breast but elsewhere in the body, and use every effort to determine beyond shadow of doubt the nature of any tumour. The profession is alive to the importance of these matters but our duty is to instruct the laity to understand the importance of getting expert advice without delay in individual cases.

It is not the purpose of this communication to deal with the therapeutic measures necessary to eradicate cancer. Generally speaking the writer believes that the early removal of cancer growths by operation holds out by far the best prospect of permanent cure. The value of radium and deep x-ray therapy is attracting much attention at present. There is sufficient evidence to show that these agencies are undoubtedly potent factors in the control of cancer in certain forms. Earnest and skilled workers in this field are accomplishing promising results but the time, in our opinion, has not arrived to state the place which this therapeutic measure should hold in the remedial measures employed for the cure of cancer.

One cannot overestimate the important rôle played by the profession in preventive medicine in recent times. A brief summary has recently been made by Dr. Frank Billings in the following paragraph published in a leaflet written by him for Cancer Week. Dr. Billings says as follows:

> "With the necessary co-operation of an enlightened educated public, the application of known and tried reliable means of prevention has lowered the death rate of tuberculosis of the lungs, the great white plague, fifty per cent. or more, and has well-nigh eradicated typhoid fever, typhus fever, yellow fever, diphtheria, cholera, malaria, small-pox, bubonic plague and other diseases

which have killed thousands upon thousands of people in the past. Through the efforts of the medical profession, nobly supported by philanthropic citizens in the education of the public, the death rate among infants and children due to diarrhoeal and other diseases, has fallen in many communities to a fraction of the former mortality. All this has been accomplished by the increasing efforts of physicians and public health workers in educating the public and in the rational application of reliable methods of disease prevention, and in the utilization of scientific means of treatment."

To-day we are fighting the plague of Cancer. The most important piece of strategy in that fight to-day is the education of the public, in order that individual cases may be brought early for professional advice. This we feel assured will prove the most effective means of saving life and ameliorating suffering in the unfortunate victims of this disease.

THE CLINICAL DIAGNOSIS OF SMALLPOX AND CHICKENPOX

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SEVERE smallpox is slowly returning to the civilized world, after twenty years of "mild smallpox"; so mild that official reports have at times shown more deaths from chickenpox than from smallpox, although both were prevalent. Recent advices from various places in Europe, England, the United States, and even from favoured Canada, show a recrudescence of the more fatal "severe" type. Not only is it likely that before a decade has passed, the prevalent type will be the severe type, but also that the incidence of the severe type will be great, for the mildness of the mild smallpox has resulted in a great relaxation of vaccination; the public generally expressing the view that they would rather have smallpox of the mild type than be vaccinated by the old scarification methods. This argument, whatever its weight may have been in the past, now fails on both counts, for the mild smallpox is becoming more severe, while the new (Canadian) method of vaccination is less severe than the old method. For these reasons those members of our profession not now expert in the matter should become familiar with the diagnosis of this disease; and all of us should use the Canadian method of vaccination; which, equally efficient with the old, is far less objectionable in application; far safer in outcome; much quicker, much simpler and requires no dressings.

Mild smallpox is pure typical smallpox, but is "scaled down" in severity, in the number of lesions, and in duration.* It does not "run to the time schedule" so closely as the more severe forms. The incubation period averages a day or two longer and is slightly more variable. The prodromal stage is often light although also often severe, and is not usually observed to be so closely limited to three or at most four days as in the more severe forms, not infrequently running to five or even six days. The lesions have the same relative distribution, character and stages as the lesions of the severe type, but the number of pustules is likely to be smaller and the duration of the different stages to be shorter. Pustulation of the lesions is moderate, light, or even not appreciable and is not as a rule accompanied by marked secondary fever; crusting, decrustation, scabbing, etc., are relatively rapid in progress.

Too often the attempt is made to "size up" such a case on general principles and to regard it as "not smallpox," merely because the symptoms are mild, the lesions few, and the course short. This policy throws all our expert differentiation to the winds, abandons all exercise of our professional observation and judgment; in short, adopts the lay attitude: "It is too mild for smallpox, and therefore it is chickenpox." As well might we follow the alleged diagnostic slogan of forty years ago with regard to diphtheria: "The cases that die are diphtheria; the others are not."

Recognition of Smallpox. As German measles is to measles proper, as paratyphoid is to typhoid, and as Duke's disease is to scarlet fever, so is chickenpox to smallpox—analogous to it, but wholly distinct from it. Neither ever protects against the other; neither ever produces the other; each breeds true. Clinically, the distinctions between mild cases of these diseases and their corresponding imitators are often somewhat difficult, to those whose experience is limited. Both diseases of each pair require intimate study if reliable results are to be secured in the diagnosis of either. In recognizing either smallpox or chickenpox the most important points to consider are:

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*The fundamental cause of the difference between mild and severe smallpox has been attributed by C. V. Chapin to differences in the virulence of the strains of the smallpox germ; by H. W. Hill to the absence of virulent Streptococci in the mild, their presence in the severe.

1. History of association with frank cases of either disease within their respective incubation periods.
2. Definite history of attack of previous chickenpox, smallpox, vaccination.
3. Date on which the first symptoms appeared.
4. Character of prodromal symptoms.
5. Date on which skin lesions appeared.
6. Location of the first lesions noted.
7. Quantitative distribution of the lesions in relation to the body and limbs.
8. Character of the individual lesions in correlation with the number of days they have been in existence.

In approaching the diagnosis of a doubtful case, the derivation of the doubtful case from, or its ability to give rise to, a frank case, is extremely important, but such evidence may not be available. The history concerning vaccination, the existence or the character of the prodromes, or even the exact date of eruption, is sometimes indefinite or unobtainable. When the diagnosis lies between *mild* smallpox and chickenpox, the history of a previous attack of chickenpox or smallpox is often not very conclusive, since the previous attack, being subject to similar difficulties in diagnosis, may have been itself wrongly diagnosed at the time when it existed. Under such circumstances careful study of the distribution and especially of the character of the lesions themselves necessarily furnishes the critically important data.

In smallpox the worst systemic disturbance and suffering are often found during the prodromes; and improvement, if only temporary, precedes, or follows closely upon, the appearance of the eruption. Severe prodromes may be followed by either mild or severe eruption; mild prodromes, usually by a mild eruption. The extent of the eruption on the face is a fair index of the general severity of the attack. In chickenpox the practical absence of prodromes means that the first appreciable systemic disturbance, if there be any at all, begins with the eruption and continues for a few days thereafter.

In smallpox, itching during the early stages of the eruption is not usually a marked symptom; nor does scratching injure the lesions much, on account of their deep-seated and tough-walled character. Burning rather than itching is to be expected in smallpox, sometimes felt at the site of a coming macule, before the macule itself appears. In chickenpox itching is highly characteristic, and since the relatively superficial and thin-walled lesions are very fragile, they are easily destroyed, not alone by the scratching, but by every form of contact. This early rupture of the lesions is in itself of very strong diagnostic import, pointing emphatically to chickenpox.

In smallpox the thick walls of the pustule prevent its rupture and permit comparatively little evaporation; the pustule, in shrinking, shrinks into the skin, and a hard, opaque, brown, very tenacious scab (the "mahogany plaque") is often formed. This is especially true of the lesions on the extremities, particularly on the palms and soles. In chickenpox, the vesicle, if not wiped off or collapsed early, shrinks by evaporation to a brittle but still somewhat elevated cap, very easily broken off or dislodged. In mild and abortive smallpox and in varioloid similar caps are at times found *on the body*, as distinguished from the palms and soles.

Differentiation of Lesions. On general survey the smallpox patient shows round lesions only, when the lesions are discrete; the shapes of confluent lesions depend of course upon the number and position of the round lesions forming the margins of the confluent area. The lesions are uniform in size, are not crenated at the margins, and are unbroken. They are chiefly on the *face and limbs*. The chickenpox patient shows round *and* oval lesions, varying widely in size, usually crenated at the margins, and almost always more or less broken or disfigured; they are chiefly on the *face and body*.

On close examination the smallpox lesion is found relatively small, round, and, in the papular, vesicular, and pustular stages, very firm. It is deep-seated; the vesicles and pustules are therefore thick-walled, and consequently rupture only with great trauma; thus, very firm pressure and hard rubbing with the ball of the finger scarcely impresses the smallpox papule, vesicle, or pustule at all. Of course it is possible to break the smallpox vesicle or pustule with the fingernail by firmly digging into the margin of the elevation. When this is done, the thick epithelial wall of the vesicle or pustule comes away, maintaining its shape, like the top of a neatly cut egg. In contrast, the chickenpox vesicle, whatever its size, is like a half-balloon, thin-walled, tense, with clear contents, giving a "pearly" appearance, and is quickly broken down at the slightest touch, the collapsed wall being soft, flimsy, shapeless—a mere rag.

Naturally, this differential test (ease of rupture of vesicles) can be made use of only if intact vesicles can be found. But intact vesicles are rare in chickenpox, if the eruption is of more than three or four days' standing, because the chickenpox vesicles are so delicate that they are ruptured by the friction of clothing or other accidents, as well as by scratching. Hence as a rule, very few or even no distended vesicles can be found in one-crop chickenpox after the first two or three days, the lesions by that time being either completely decapitated, showing merely small raw or crusted pits on the vertex of low, round or oval elevations; or else existing as pits of the same character, *overlain* by the macerated opaque, white, shrivelled, wrinkled, empty, easily brushed off epithelial rag, representing the remnants of the previously distended and thin and transparent walls of the vesicle, now ruptured. Hence, the very fact that plentiful unruptured vesicles present themselves for examination is itself presumptive of smallpox, although this condition may be found in chickenpox at times in the first day or two of any one of the successive crops of the eruption. On the other hand the presence of plentiful broken-down vesicles is itself practically conclusive of chickenpox. (*Note*—I have seen a plentiful crop of chickenpox vesicles on the back which had been evacuated of their contents wholesale by rubbing the back firmly with oil or vaseline, at the height of the vesicular stage, to relieve itching. The oil or vaseline, rubbed in as the vesicles were emptied and smoothed down, had kept these "epithelial rags" in place and prevented them from drying out. The slippery oil prevented the examining finger from securing a foothold to dislodge the rag; and the vesicles, being already empty, could not be further emptied by pressure. This condition had led to the diagnosis of smallpox, on the ground that the "vesicles" were firm and resisted the efforts to break them down! It must be confessed that at a little distance and at the first glance, the smooth, yellowish white caps, lying on the summit of the engorged bases of the vesicles, would have suggested smallpox, but for their irregularity in size and shape. On close examination the differentiation was easy.) The reddened areolae which are found surrounding the pocks of both diseases are often similar, but the smallpox areola (until secondary infection late in the disease may alter conditions) is generally narrow, and since it surrounds a round lesion, is generally circular. The chickenpox areola is usually wider, and more irregular in outline; the depth of colour diminishes more gradually towards a more diffuse edge; and when the lesions are oval the areola corresponding to them is oval also. Finally the chickenpox areola frequently, although by no means invariably, shows irregular flaming offshoots, which give the whole the appearance of a bright red ragged star.

Some prevalent misconceptions concerning the differential diagnosis are:

1. That chickenpox occurs only in children. It is true that the majority of the chickenpox cases occur before adolescence is ended, but cases in young adults and even in old people are by no means uncommon. I have seen it in a woman of fifty-three; and in many young adults of both sexes.

2. That smallpox does not invade the scalp. It is true that chickenpox usually invades the scalp while smallpox sometimes does not, but the point is by no means final or even presumptive evidence.

3. That smallpox alone invades the palms and soles. It is true that smallpox almost always invades the palms and soles, or both, but chickenpox not infrequently shows one or more palmar or plantar lesions.

4. That smallpox alone presents lesions in the mouth, pharynx, etc. The fact is that almost every case of chickenpox as well as of smallpox shows some mouth or pharyngeal lesions.

5. That smallpox lesions are umbilicated (dimpled), while chickenpox lesions are not. This last statement might be made almost without reservation, if confined strictly to the *vesicles* of the two diseases. But the umbilication of the smallpox vesicles disappears on pustulation (perhaps by liquefication of the internal restraining bands which are supposed to produce the "dimple"), while the subsequent drying out of the pustule reproduces a pseudo-umbilication in the late pustular stage. On the other hand the chickenpox vesicle, being swept off or broken, leaves the slightly pitted summit of the papular base of the vesicle exposed. On drying, and especially after crusting, the lesions thus evolved often present a certain dimple, sometimes mistaken for umbilication. This "umbilication" in chickenpox is obviously, from the above descrip-

tion, wholly different in stage, cause, and structural features from the true umbilication of the smallpox vesicle, and should never be confused with it. It is not even analogous to the secondary umbilication of smallpox, for in the latter the epithelium covering the pustule is still intact, although dry. It is stated by J. M. Armstrong, of St. Paul, that smallpox *papules* under moderate magnification show umbilication also. Occasionally, one or more chickenpox vesicles, at an early stage, may show a light dimpling, or even umbilication. A diagnosis should never be based on the condition of one or two lesions, but on the prevalent type. I have seen what proved finally to be generalized vaccinia, developing eight days after vaccination, diagnosed by high authority as smallpox, and by other high authority as chickenpox, both errors depending on attaching too much importance to the peculiar character of one or more lesions, while overlooking the predominant characteristics of the predominant type.

The respective characteristics of the lesions in smallpox and in chickenpox above described, depend on the relatively deep-seated location of the former in the skin, as compared with the latter. Occasionally chickenpox vesicles of the forehead and especially of the palms or soles, may be found more deeply seated or having over them a tougher epidermal covering than usual and therefore approximating somewhat to the smallpox characteristics. The only lesson of this fact is that the characteristics of the lesions of the face, palms, and soles should not be considered as decisive, when searching for the differential points.

Comparative Natural History of Severe Smallpox, Mild Smallpox, and Chickenpox. The case of severe smallpox will show:

1. An incubation period (*i.e.* from exposure to earliest symptoms—not to eruption) of practically twelve to fourteen days (in mild smallpox twelve to twenty-one days). The incubation period can be determined accurately only in cases where exposure occurs on a known date, with no exposure before or after; provided also that the date of earliest symptoms resulting from such exposure is also definitely fixed.

2. No definite history of previous attacks of smallpox. When mild smallpox has prevailed for years, often confused with chickenpox, and *vice versa*, this history is of little account, especially when the previous diagnosis was made, as often happens, by the laity. Examination for healed pits should be made. Round pits indicate smallpox; oval pits, clean cut, indicate chickenpox. Confluent smallpox may yield pits of irregular shape. In mild smallpox, and in chickenpox, pits of any kind may be few and small. Second attacks of smallpox are very rare although they are not unknown.

3. No history of successful vaccination within five to seven years. Careful examination for vaccination scars should be made.

4. Prodromes, lasting generally about three full days, and including headache, *terrible backache*, fever, epigastric pain, chills;—a sudden severe onset. Mild smallpox sometimes presents very indefinite and trivial prodromes. When definite, a history of four days or more of prodromes may be offered. (see 5.) These symptoms mitigate or even disappear before or with the appearance of the eruption.

5. First signs of eruption late on the third or during the fourth day of attack. In mild smallpox the earlier eruption, when sparse, may be unnoticed for a day or so, thus prolonging the observed interval between onset and eruption, which latter may be noticed first as late as the seventh day.

6. Eruption beginning on face and wrists. In mild smallpox, the lesions are sometimes so few that the earliest ones are overlooked until the full crop has appeared.

7. Eruption most profuse on limbs rather than body. In mild smallpox, with sparse lesions, there may be too few lesions to permit any real comparison of relative abundance at different points.

8. Palms and soles nearly always attacked. In mild smallpox, one or two lesions in one palm or one sole may be all that can be found in these locations.

9. Eruption develops in one crop, the lesions appearing steadily for twenty-four to forty-eight hours, the face lesions usually further developed than the body lesions. In mild smallpox, abortive lesions *i.e.* not following out the regular stages, are sometimes found.

10. Lesions round at all stages; margins not crenated; all those of the same stage of development usually of the same size; appear in one crop coming out steadily twenty-four to forty-eight hours; each lesion, typically, passing through four stages.

The stages are: (a) "Flea-bite" macules (spots) each lasting twenty-four hours; these exist alone during the first day of eruption. Before or with the appearance of the eruption, the systemic symptoms improve; but of course, when the prodromes are exceptionally mild, this improvement can hardly be observed; (b) "Shotty" papules, (pimples), each lasting twenty-four hours, which develop from the macules during the second day of the eruption, the earlier papules therefore co-existing with the later macules. (c) Umbilicated "shotty" vesicles (blisters), each lasting twenty-four to seventy-two hours, which continue to appear as their preceding macules and papules mature, during the third to fifth day of eruption. (d) Firm opaque pustules, each lasting four to six days, which exist in full blossom during the sixth to twelfth day of eruption. With this pustulation, the secondary fever begins; but in mild smallpox pustulation is usually very innocuous and little or no secondary fever is observed. (e) Firm crusts begin to appear about the thirteenth day of eruption; secondary or pseudo-umbilication, due to drying, may be found about this time. (f) Dense scabs and deep-seated, tenacious, "mahogany" plaques—the latter still covered with the original epithelial wall of the pustule, now flattened out again—develop as drying out continues. They are variable in duration, lasting many days or weeks in severe or neglected cases. In mild smallpox the absence of severe pustulation often obviates the formation of the deep-seated tenacious plaques, except in the palms and soles. Those formed are rather superficial and are removable without great difficulty. It is to be noted that as some lesions develop earlier than others it is possible to have, after the first twenty-four hours of the eruption, both macules and papules, and towards the end of the first forty-eight hours even a few vesicles; during the next twenty-four to forty-eight hours, papules, vesicles, and pustules; thereafter, however, vesicles and pustules alone, later followed by pustules and crusts, will be found; finally, crusts, scabs, and plaques, leaving pits as they disappear. In mild smallpox, aborted lesions sometimes add to the variety of conditions present.

11. Pitting, especially following marked pustulation, is deep and permanent; the pits are red for months, then white. Unless extended by impetigo, or fused by confluence, the pits are round. Mild smallpox yields few and small pits only, as a rule.

Prodromal Rashes. During the prodromal stage of smallpox and therefore before the eruption proper appears in its earliest form of macules, there may be diffuse erythematous patches, greater or less in extent, very irregular in distribution, extent and duration, with a tendency to rapid changes. Confusion of these with the rash of scarlet fever may be avoided by noting that the scarlet fever rash is practically never found on the face; and that the scarlet fever rash is composed originally, and always at its spreading edge, of small dots of red, with white skin between. Erythematous rashes are continuously red, *i.e.* not composed of isolated dots. Of course also, knowledge of the systemic symptoms of scarlet fever, the tongue, throat, gland enlargements, vomiting, aid in the differentiation; as also the length of the prodromal period which in scarlet fever is rarely more than twenty-four hours.

Confusion of a prodromal rash of smallpox with the true rash of measles, when it resembles the latter, may be escaped by noting, first, that the measles rash does not develop until the fourth day after the onset of measles, while the prodromal rashes of smallpox develop on the second or third day after the onset; second, that the measles rash will be preceded and accompanied by the coryza, photophobia, bronchitis, etc., typical of measles, rather than by the symptoms of early smallpox; third, by the character of the lesions themselves, which although blotchy in both cases, are raised and palpable in measles, not raised and not palpable in the prodromal rash of smallpox. As in the diagnosis of all infections conveying immunity, the history of a previous attack of scarlet fever or of measles will of course be strong presumptive evidence against these, while the history of previous smallpox or recent (*i.e.* within seven years) successful vaccination practically excludes smallpox.

The case of chickenpox will show:

1. Incubation variable, but from two weeks to eighteen days as a rule (see smallpox 1.)

2. No definite history of a previous attack of chickenpox (see smallpox 2.). Second attacks of chickenpox are even rarer than second attacks of smallpox.

3. A history of successful vaccination within five to seven years, or a definite history of previous smallpox, practically eliminates smallpox, and therefore points to a diagnosis of chickenpox; absence of history of one or other or both of these does not, of course, indicate smallpox, but leaves the diagnosis open to be decided on other grounds.

4. No history of prodromes usually; if any, chiefly in adults, and for not over twelve to thirty-six hours preceding the eruption.

5. First signs of eruption noticed in first few hours of illness, *i.e.*, the systemic disturbance is usually synchronous with or immediately precedes eruption. (But see 4.)

6. Eruption beginning on back, chest or face.

7. Eruption most profuse on the body

8. Palms and soles with one or two lesions; such lesions are less constant and less abundant than in smallpox.

9. Eruption appearing in successive crops, *on successive* or *alternate* days.

10. Lesions round and oval, with much variation in diameter, even at the same stages of development; margins often crenated (scalloped). Each crop passes quickly through the following stages;—(a) Macules, each lasting a few hours. (b) Soft, superficial papules (pimples), each lasting a few hours. (c) Clear, thin walled, tense vesicles, (blisters), each lasting a few hours. These latter are easily destroyed and leave then "cupped" or "pitted" elevations, raw, red, and weeping, but quickly crusted. When the vesicle is ruptured without total removal of the cap, a white, opaque, shrivelled rag of epithelium, lying more or less loosely over the pit remains. (d) Theoretically, pustules follow. Practically, the vesicles are almost always destroyed before pustulation can occur. But I have seen a vesicle, on the back of a finger, preserved from rupture by a plaster cast, develop into a tense, thin-walled, oval, half-balloon pustule, nearly a quarter of an inch long. (e) Crusts, lasting a shorter or longer time according to treatment, etc. Each crop completes its cycle in two to four days. Because of the rapidity of the maturation of the lesions, even the first day may show all stages from the macule to vesicle, including ruptured vesicles. In the first week macules, papules, vesicles, intact or broken, and crusts, derived from different successive crops, the developed lesions from the older crops, the newer lesions from the later crops, may be found together. Thereafter the earlier forms disappear, and in the second week crusts alone or in great predominance are found. The older lesions are sometimes complicated by presence of impetigo; sometimes occurring as a second, late, infection, but sometimes apparently from a double infection occurring at the time when the chickenpox itself was originally contracted.

11. The pits are few and superficial, often oval. When extended by severe forms of impetigo, which not uncommonly affects chickenpox lesions during and after the second week, the pits may be irregular in outline.

Methods of Vaccination. There are several methods of vaccination, of which the newer method introduced into and used in the Canadian army during the Great War appears to have many advantages. First there is the old scarification method; tedious, painful, and very liable to infection by other microorganisms; requiring also frequent dressing. Second, there is a newer method by a series of linear scratches or superficial incisions just through the epidermal layers and drawing no blood. This is much superior to the scarification method but makes an open wound and is liable to infection. The Canadian method is as follows: The skin is carefully disinfected by soap and water, and alcohol and ether. On this sterilised area the contents of one capillary tube is deposited at three spots, preferably the three angles of a triangle the sides of which are two inches long. By means of a sterilised sewing needle held almost parallel to the skin's surface, six or eight punctures are made through each drop, merely penetrating the outer epidermis. No blood is drawn, and pain is scarcely felt. On completing the punctures the surplus vaccine is wiped off, and the sleeve may be drawn down over the arm again. The after treatment consists in *leaving the arm alone*, without any dressing. Any dressing applied more or less constricts the arm and prevents free evaporation, with the result of inducing more or less maceration and softening of the otherwise stout, firm pustule wall. If left alone the pustule remains intact, drying down to a firm "shoe-button" scab, which drops off when healing is completed.

Persons previously successfully vaccinated or who have had smallpox, will often show red, itchy pimples at the sites of puncture within twenty-four hours. This immediate or anaphylactic reaction usually indicates that the person showing it is immune to vaccination and will not take either vaccine or smallpox. Occasionally "takes" develop a week or two later despite this initial reaction.

Non-immune persons usually show no reaction whatever for four or more days, even the site of the punctures being difficult to locate exactly. About the end of a week however, the puncture sites show macules, quickly becoming papules, vesicles and pustules in due order. The lesions are strong-walled and remain intact, if allowed to evaporate freely. They are surrounded by an areola, and accompanied by tender axillary glands, some fever and other mild systemic reactions, lasting a day or two. As the still intact pustules dry, they contract, forming hard more or less spherical scabs (shoe buttons) which finally detach themselves, leaving a healed depressed base or pit which gradually flattens out.

SCOLIOSIS OR LATERAL CURVATURE OF THE SPINE

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An examination of the records of patients treated for scoliosis in any of our hospitals reveals the fact that this is still one of the most discouraging conditions which is met with in surgical practice. Perhaps the failure of surgeons to secure satisfactory results in the treatment of this condition may be attributed to one of two things; first, we know so little about scoliosis, and, second, perhaps we have not sufficiently appreciated the normal function of the parts which are eventually deformed in the condition described as scoliosis.

In the years immediately preceding the Great War general interest was taken in the study and especially in the treatment of this condition, and many articles were written on the subject. Perhaps the most important of these were contributed by orthopaedic surgeons living on this side of the Atlantic, although the contributions of Calvé and other European surgeons have tended to elucidate many important phases of this most obscure condition.

The word scoliosis is derived from the Greek "*skolios*" meaning curved or bent. Usage has confirmed the selection of this word, although it hardly describes the condition, because scoliosis as we understand it to-day, denotes not only a twisted and deviated spine, but a condition of the trunk or the whole body in which each component part has performed a definite rôle in a certain orderly sequence. Scoliosis may be physiological and normal, or pathological and abnormal.

The Effect of Movement.—During the year 1911 an observation was made in Montreal which seemed at the time to be a discovery, yet, "Is there anything whereof it may be said, See this is new? It hath already been of old time which was before us." This discovery was the simple fact that rotation or side-bending of the trunk in one direction causes rotation of the bodies of the vertebrae in the opposite direction. This, with the fact so strongly accentuated by Feiss, that no single part of the thorax moves separately, but each and every part moves together synchronously and has a definite rôle in every movement of the trunk, is of great importance. On movements of the trunk the spinal column, as a whole, becomes twisted and bent. The individual vertebrae are rotated on their axes. The ribs on one side move or change their shape or form whilst the ribs on the other side move and change their shape in a direction or form much opposed to the shape or form assumed by their fellows of the opposite side. These changes of form are natural and are normal, they bear a definite relationship to one another. These can be expected to accompany, to form part of, every movement of the trunk, according to physiological laws. If these movements are in the nature of side-bending or rotation of the trunk we may expect that the trunk will assume a position of physiological curvature. Each and every part of the trunk will carry out a physiologically prescribed part; these, together, will form a definite physiological picture, known as *physiological scoliosis*. This complex picture known as physiological scoliosis follows, indeed, forms part of a normal function. In it there is no permanent change. From it there is a return to the normal or to a physiological scoliosis of a reverse or opposite character. It pictures a condition which is seen in the thorax of each and every one of us scores of times every day. Physiological scoliosis in the less noticeable forms is a position of rest which is seen in those who suffer from physical exhaustion and in those whose muscles have lost their normal tone.

Pathological Scoliosis.—If we examine bony skeleton of one who has suffered from pathological scoliosis we find that in it is pictured a condition which is the counterpart of physiological scoliosis. It differs from it, however, in the fact that pathological scoliosis is the greater, physiological scoliosis is the less. Pathological scoliosis is an exaggeration of physiological scoliosis. From physiological scoliosis there is a return to the normal or to a physiological scoliosis of a reverse character, whereas in pathological scoliosis there is no return to the normal. In pathological scoliosis there are changes, whereas in physiological scoliosis there are no changes in the architecture of the bone.

Etiology.—No one factor is responsible for scoliosis. Sir Arthur Keith, in his delightful book, entitled "The Menders of the Maimed," states that every one has agreed that the scoliotic posture is primarily assumed to rest the muscles which balance the vertebrae upon each other and maintain the spine in the erect position. He says; "When the proper spinal muscles begin to yield from exhaustion the vertebrae swing around until they are held up by ligaments which bind their transverse processes to the necks of the ribs. The ribs would, if they could, swing around with the vertebrae, but they are held by the powerful abdominal and intercostal muscles. In reality the spinal muscles abandon their static function to the powerful muscles which act on the lateral and ventral parts of the ribs, thus, the vertebrae, instead of being balanced on each other, come to be braced, whenever the erect position is assumed, against the dorsal ends of the ribs, which soon begin to yield and become deformed in the manner with which every one is familiar".

Yet it is a well-known fact that many cases of pathological scoliosis do not originate from the exhaustion of spinal muscles. Adams has pointed out that deformed vertebrae causing an unstable base to the spinal column may be the primary cause of scoliosis. English writers have insisted that congenital deformities of the vertebrae, also, may be the primary cause of scoliosis. Further it is agreed that the weakening of the spinal muscles or stays which support the vertebral column or mast may be the primary source of a scoliosis which is most difficult to deal with.

Prognosis.—The prognosis of pathological scoliosis depends on two factors. First, the etiology, and, second, the degree of change which characterizes the bony framework of the trunk. Let us consider the latter. Experience has proved that we cannot alter the *architecture* of bones which are organically changed, of vertebrae which are wedge-shaped and of ribs which have lost their resiliency.

For some years Doctor H. B. Cushing and the medical staff of the Children's Memorial Hospital in Montreal, have insisted that few cases of extreme scoliosis attain to old age. Many die from circulatory disturbances due to obstruction caused by thoracic deformities. Dr. F. G. Finley, of McGill University has, within the past year, published evidence which tends to confirm this statement.

Treatment.—Our ability to relieve pathological scoliosis will depend on our ability to reverse the deformity, to so change the contour of the thorax and the trunk, both as a whole and in its parts, that it will be as far removed from pathological scoliosis as possible. This is the key to treatment. This is our hope of relief. Unless we use this key we cannot expect to see the delectable land of normality. This is the principle which has been so often forgotten in the past.

In the treatment of scoliosis due to muscular weakness every individual must be made to develop the weak muscles which should furnish the staying power of the vertebral column, to stretch the soft parts which are contracted, to remodel bones which are capable of being remodelled.

Sir Arthur Keith says that, "The true agents of redemption are the muscles of the short levers of the vertebrae—the erector spinae and its derivatives which act on the spinous and transverse processes." But to strengthen these the exercises chosen must be based on physiological principles which are calculated to produce a physiological scoliosis of the reverse order to the pathological scoliosis already existing, namely, the production of a scoliosis with convexity to the right where a scoliosis with convexity to the left already exists or *vice versa*. The forces exerted must be calculated not only to act on the thorax but to control the lumbar vertebrae. Every patient suffering from scoliosis should be treated as an individual, a separate study, and for each patient suffering from this condition definite exercises must be prescribed and carried out in order that in none will opposing forces be called into action to defeat the very ends desired. For the majority of cases this is all that is expedient, necessary or justifiable.

Theory and experiment have alike proved the importance of increasing the capacity of the thorax and remodelling the architecture of the skeletal walls in cases of scoliosis so that the thoracic organs may be in the best possible position to function. This can be done by the placing of each component part of the thorax in a form or a position in every way opposed to that of deformity; that is, in a position of physiological scoliosis of the opposite character to the pathological scoliosis already existing.

No matter how we treat scoliosis, no matter what method we employ to treat lateral curvature, the fundamental principle to be carried out during treatment must be the reversal of the deformity—the placing of the thorax in a position as far removed from that of the deformity as possible. We should do this not only because the further the distance from deformity the nearer the normal becomes the patient, but because pathological scoliosis is not only a distressing deformity but the position of pathological scoliosis is one in which the thoracic organs are placed at great disadvantage and their function is materially interfered with.

Treatment must aim at the prevention of irremedial bony changes, because no effective form of treatment has been found for bones whose external architecture has been altered by organic change. Be the treatment carried out early or late it must aim at placing the thorax, and the trunk generally, in a position as far removed as possible from that of the deformity. In a number of patients suffering from scoliosis, pressure applied according to physiological rules may benefit, if the strictest attention is paid to the mechanics of the spine and thorax and to the function of its component parts.

It is open to question whether much of the pressure which has been exerted in the past for the sake of straightening spinal curvatures has not been applied on the lateral surface of the rib wall of the convex side of the spine. This pressure, as one can see, will tend to do two things and both of these to the detriment of the patient, it will tend to increase the flattening of the already flattened and deformed rib wall, and it will tend to further rotate the bodies of the vertebrae into a position of greater deformity.

In certain cases pressure may be applied by means of plaster jackets, but, in many, it is, perhaps, wiser to employ a brace calculated to hold the thorax in a position of correction. It seems essential that this brace should be easily removable so that the patient may depend, to a greater extent, on treatment by exercises which will develop the muscles attached not only to the ribs, but to the vertebrae themselves.

As Sir Arthur Keith says, "the part played by the ribs in checking the rotation of the vertebrae and the lateral curvature of the spine has not been sufficiently emphasized." We may add that neither has it been sufficiently emphasized that the part played by the ribs when pressure has been applied on them in order to relieve the spinal curve, may be to the disadvantage of the patient; and, conversely, it is important to remember that those ribs which may be the cause of the deformities of the spine can be used as levers for the correction of the deformities. The power which it is possible to exert on these ribs is that of the great muscles which maintain the erect position of the spinal column. The ribs are long and powerful levers, particularly from the fifth to the tenth inclusive, and the great muscular sheets attached to their lateral and ventral aspects can act at an enormous advantage compared to the muscles acting on the short transverse and spinous processes.

In conclusion we may state that in our opinion in all cases of scoliosis, be they mild, or be they severe, treatment must be based on the necessity of maintaining the thoracic walls in a position as near as possible to the normal in order that there may be no interference with the function of the vital organs.

We do this by exercises, posture and pressure, all calculated to bring about the maximum of relief by the minimum of sacrifice. We endeavour to maintain our position of correction. If we fail, we then consider the advisability of operative procedures. Although these have been already fully described it may be wise to mention that the result aimed at is the securing of stability of the vertebral column by ankylosing adjacent vertebrae. This may be done by the producing of new bone on the posterior surfaces of the laminae, transverse and spinous processes. This operation has been performed in a series of patients with gratifying results,—the patient's general condition having been markedly improved. In each case an increase in the patient's height was obtained and the patient's morale decidedly benefitted.[1]

REFERENCE

(1) *Journal of Bone and Joint Surgery*, July, 1922

"If the modern surgeon is vexed to hear that surgery is, as Galen declared, but a method of treatment, he is vexed by a truth which in the best interests of our profession he ought to welcome.—*Allbutt Historical Relation of Medicine and Surgery.*

"That man who observes and thinks for himself is wise, but he who sits long with the observations and the thoughts of others, scorning not the opinions of the obscure, yet observes and thinks none the less for himself, is the teacher of the ages."—*Aristotle.*

CONGENITAL SYPHILIS*

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THE difficulties encountered in the detection and treatment of congenital syphilis are recognized alike by the general practitioner, paediatrist and genito-urinary specialist. Cases are being frequently overlooked as a result of the paucity of symptoms presented. In those cases which are recognized, proper treatment not uncommonly is neglected, because of a wide spread belief that the results of such treatment are unsatisfactory. The following contribution, which is an analysis of three years' work in a clinic for luetic children is offered in the hope that it may clear up a few points in the diagnosis of the condition and also tend to modify the prevailing pessimistic outlook regarding the prognosis.

Since July, 1919, 186 cases of hereditary syphilis have been under observation in either the wards or Out Patient Department of the Hospital for Sick Children. Some of those admitted to the wards were subsequently treated and observed in the Out-Patient Department, but a great many were lost sight of, returning after discharge to the care of their own physician. A few facts of interest may be obtained by an analysis of the total number of cases, but the most important information, such as the results of treatment, has been gleaned by a study of ninety-nine cases which were observed for a period of more than four months. To this number has been added one from private practise in order to facilitate the recording of percentage results.

Symptomatology.—The age at which these patients first reported for treatment and the symptoms presented at that time are of considerable interest from the point of view of prognosis. Of the 100 cases, sixty-four, or nearly two-thirds were over five years of age; thirteen were between one and five years and twenty-two were under one year. Thus it will be seen that the great majority of cases do not come under medical supervision until the tertiary stage is reached. Of the sixty-four cases over five years of age, thirty-one or nearly one-half reported because of an interstitial keratitis; thirteen, or twenty per cent. were referred for examination because one or both parents had been proven to be infected. Periostitis was the condition for which four cases sought relief and cerebro-spinal manifestations accounted for six. Of the thirteen cases whose ages varied from one to five years, which is usually considered the symptomless or latent stage of hereditary lues only three reported because of some condition associated with a syphilitic infection, *viz.*, two with condylomata and one with mental deficiency due to cerebro-spinal lues. Of the twenty-three cases under one year—the so-called early stage—nineteen were suffering, when first seen, from secondary manifestations such as snuffles or eruption. Six of the nineteen cases or nearly thirty-three per cent. had a pseudo-paralysis due to epiphysitis.

Considerable discussion has taken place recently, regarding the frequency of cerebro-spinal involvement in the early stage of congenital syphilis. With this in mind we have examined the spinal fluid in the last fourteen cases and in four of them have found pathological changes which were pathognomonic of cerebro-spinal involvement.

An analysis of the figures just quoted clearly shows why the treatment of congenital syphilis has not produced more encouraging results. Only one-fifth of the 100 cases had early manifestations severe enough to compel the parents to seek medical advice. As will be shown later it is these early cases which are so readily cured. It is possible that some of the older children did have suggestive symptoms in infancy but these must have been very mild as it was seldom that a history of such symptoms could be obtained from the parent.

It is our belief that the diagnosis of congenital syphilis has been rendered difficult in the past because too much stress has been laid on unimportant and rare manifestations For example, changes in the skull bones such as bossing and cranio-tabes which have been described by English writers as syphilitic in origin are almost never encountered. Congenital anomalies, mongolian idiocy, and alopecia are seldom if ever the result of a syphilitic infection. One should, however, be suspicious of every snuffling infant during the early months of life. This sign is one of the first to appear and is by far the most frequent early manifestation. If, in addition an enlarged spleen is found on examination, a tentative diagnosis of syphilis is justifiable. The time of appearance of the eruption varies. When it does appear it is almost always of the well-known maculo-papular variety. Pemphigoid and pustular syphilides are almost never seen. There were none in this series of 186 cases. Epiphysitis, manifesting itself during the first four months of life as pseudo-paralysis of one or both upper extremities without local signs of inflammation in the joint and without elevation of temperature occurs in twenty-five per cent. to thirty per cent. of the cases. There is no other condition which simulates syphilitic epiphysitis so closely as to render the diagnosis uncertain.

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*Read before the Ontario Medical Association, May 1922.

Note:—The material for this paper was obtained from the Wards and Out-patient Department, Sick Children's Hospital, Toronto.

There is one other sign which occurs so uniformly in the early stage that it is of considerable value in diagnosis. It has been observed by one of us for some years past but has never been described in any text-book or writing on the subject. The sign referred to is a "froggy" or "fishy" appearance of the eyes simulating at times a mild exophthalmous. This "frog-eye" or "pop-eye" appearance is also to be seen in some premature infants but not with the same regularity that it is in those suffering from lues.

There is, as a rule, little difficulty in recognizing the tertiary or late manifestations of the disease. Interstitial keratitis, Hutchinson's teeth and periostitis are the most common and the first two at any rate can hardly be confounded with any other condition. Our experience has been that deformities of the teeth are diagnostic of syphilis only when involving the upper central incisors.

Diagnosis.—The reliability of the Wassermann reaction has always been a bone of contention between the clinician and the pathologist, and the controversy is not by any means settled at the present time. It is generally agreed that positive reactions may be obtained in cases who are definitely non-syphilitic; the difference of opinion exists, however, regarding the possibility of a negative reaction in untreated, clinically syphilitic patients over three months of age. Under this age it is conceded that a negative reaction may exist even though the child is infected and we have had several examples of this in the last three years. Our experience has been that two successive negative Wassermann reactions obtained on blood which has been collected with reasonable precautions as to technique is positive evidence that the patient is not suffering from congenital syphilis, provided the patient is more than three months of age and has not previously received specific treatment. All Wassermann tests from the Hospital for Sick Children have been performed by the pathological department of the Toronto General Hospital under the direction of Dr. Detweiler. Great credit is due to this laboratory for the fact that in three years we have had no reason to change our conviction as cited above. A short resumé of two cases during the past year serves to demonstrate the reliability of the test. A girl of about ten years of age presented tumefactions over the cranial bones which closely simulated subperiosteal gummatous deposits. After repeated negative blood-Wassermann reactions operation was advised and the condition found to be sarcomatous. Another case was that of a twelve year old girl presenting a periostitis of the lower end of the femur. Clinically the case was one of syphilitic periostitis and the x-ray findings also were characteristic of this disease. After repeated negative Wassermann reactions an operation was performed and the lesion discovered to be a subacute osteomyelitis due to some low-grade pyogenic infection.

Treatment.—It is not an easy matter to tabulate a series of cases such as this and record results of treatment which will be at the same time comprehensive and accurate. There are many factors which render accuracy difficult of achievement. The length of time the patient is under treatment, the stage of the disease present when treatment is commenced and the regularity of such treatment must all be considered. Also one must decide whether the standard of improvement is to be serological or clinical. The scheme which we have decided upon as providing the most useful information is as follows: -Only those cases which have been under observation for a period of four months or more were selected for analysis and these cases were grouped according to the stage of the disease presented when treatment was commenced. By this means the most important factor influencing the chance for complete cure is more clearly shown. It must be understood that by selecting only those cases under treatment for more than four months no information is given as to the actual mortality since the fatal cases as a rule die shortly after coming under observation. The figures for this can be compiled however from the total number of cases seen in the last three years. Of 186 cases, thirty-five or nineteen per cent. died. This death rate is a little lower than that given by other writers. The Wassermann reaction has been used as the standard for determining the results of treatment, since it is a well recognized fact that clinical manifestations with one or two exceptions, disappear rapidly after the administration of arsenic, and for this reason a clinical standard provides a very unreliable basis for the recording of progress toward permanent cure.

The routine of treatment adopted is as follows: The intravenous injection of one of the arsenical compounds once a week for six weeks followed by a course of mercury for six weeks. Blood for a Wassermann test is then taken and if still positive the courses are again repeated. This routine is continued until a negative test is obtained or the hope of securing a negative test is regarded as small. The arsenical compound recommended is either sodium diarsenol or phenarsenamine. All injections are intravenous. The veins used being those of the scalp, the antecubital space, or the external jugular. The longitudinal sinus is never used since such a procedure is not unattended with danger. Mercury is given by inunction to the infants, and by inunction and by mouth to the older children. Intramuscular injections are employed in those cases where there is a well founded suspicion that the home treatment by inunction is being neglected by the parents. In a few instances arsenic and mercury have been administered at the same time. The cases of neuro-syphilis were treated in the manner suggested by Swift and Ellis; this is an intravenous injection of an arsenical compound followed by drainage of the cerebro-spinal tract and injection intrathecally of salvarsanized serum from the patient.

The first group for consideration comprised those cases first seen when under one year of age, or during the early stage of congenital syphilis. There were twenty-two cases in this group, of which two died with broncho-pneumonia; nineteen of the remaining twenty are, at present, Wassermann negative; three have had only one negative test; six have had two successive tests; and ten have had from three to eight successive negative tests. The first negative Wassermann was obtained on an average of six months after the commencement of treatment, the shortest period required being four months and the longest eleven months. To obtain this result it was usually necessary to administer two courses of arsenical treatment and two courses of mercurial inunctions, though in seven cases one course of each was sufficient. The twentieth case was one of hydrocephalus due to cerebrospinal syphilis which received intravenous and intraspinal treatments for a period of ten months at the end of which period the blood Wassermann was negative and the cerebrospinal fluid was normal. This patient left the city and disappeared for nine months and only recently returned. The blood Wassermann is again very strongly positive but a permanent cure would undoubtedly have been effected had proper treatment been continued. This was the only instance in the group where the Wassermann reaction has returned to positive after having once become negative so that we feel justified in assuming that the more recent cases with only one negative Wassermann will prove to be permanently cured.

The second group comprises those cases first seen between the ages of one and five which period corresponds to the latent stage; of these none died; six are at present and have been for a period of from two to fourteen months, Wassermann negative. In five the test has been reduced from a very strongly positive to a positive or a weakly positive reaction, and two are unimproved. The first negative reaction was obtained on an average of eleven months after treatment was commenced, the shortest period required being four months and the longest nineteen months. Two cases in this group became Wassermann positive after having been negative.

The third group of sixty-five cases consists of those children first seen when over five years of age—the so-called late or tertiary stage. One of these children, a mental defective with cerebrospinal syphilis, died suddenly in convulsions. Twenty-four are at present Wassermann negative; twenty-two have been improved and sixteen unimproved. The first negative Wassermann was obtained on an average of sixteen and one-half months after treatment was commenced, the shortest period required being six months and the longest twenty-seven months. There were twenty instances in this group of the return of the Wassermann reaction to positive after having once been negative. It is evident that, in treating these patients over a long period of time, one is courting danger in the form of chronic arsenical poisoning. Twenty-two of the sixty-five late cases received more than forty injections of salvarsan, one receiving sixty-eight treatments. There have been four instances of the above mentioned complication in the last three years. One occurred after only four treatments, one after sixteen and one after twenty-five and one after forty-four. In all cases there was severe vomiting, jaundice, anorexia and loss of weight. Recovery occurred in every instance. In two of these cases the urine examined during the attack showed no albumen and no casts. At present we have no suggestions to offer which would assist one in anticipating the onset of chronic arsenical poisoning.

		Early Stage		Latent Stage		Late Stage	
		No.	Percentage	No.	Percentage	No.	Percentage
No. of Cases		22		13		65	
Wass. Negative		19	86.4	6	46	24	37
Much Improved		—	—	2	15.4	13	20
Improved		—	—	3	23	9	13.8
Unimproved		1	4.5	2	15.4	18	27.7
Died		2	9	—	—	1	1.5
No. relapsing from Negative to Positive		1	4.5	2	15.4	20	31
Probably Cured		19	86.4	5	40	20	31
1st Neg. Wass.	Aver. Time	6 mos.		11 mos.		16.5 mos.	
	Earliest	4 "		9 "		6 "	
	Latest	11 "		19 "		27 "	

Total Results 100 Cases		
	Probably Cured	44%
	Much Improved	20%
	Improved	12%
	Unimproved	21%
	Died	3%

Perhaps the greatest problem to be disposed of is that relating to the older cases who have been under treatment for two years or more without any improvement in the intensity of the Wassermann reaction. Although these cases are symptom-free and apparently healthy it is possible that after cessation of treatment the disease may light up again. On the other hand continuation of treatment may imperil the patient's life by occasioning the serious complication of arsenical poisoning. We have no solution to offer for the problem. It is possible that the careful observation of such cases over a number of years may show that the dangers of relapse have been magnified.

In conclusion we wish to record certain convictions which we have gained as the result of three from serious complications such as broncho-pneumonia can be permanently cured by the regular administration of salvarsan and mercury. The first negative Wassermann may be expected on an average of six months after the commencement of treatment. (2) Interstitial keratitis appears to be little, if at all, improved by specific therapy. In fact the onset and course of this manifestation of hereditary lues seems to be entirely independent of treatment. (3) Cerebro-spinal lues if detected early can be greatly improved and sometimes completely cured by intravenous and intraspinal treatments. If detected later the process may be arrested but the damage already done is irremediable and manifests itself in mental deficiency, paralysis and deformities. (4) The two most important factors in successful treatment years' work: (1) Every case of congenital syphilis in the early stage, which can be protected are,—(*a*) the persistency and regularity of treatments and (*b*) the careful supervision of the child's dietary and routine of life with a view to maintaining general health and nutrition. (5) The average length of time required to obtain a persistently negative Wassermann in the latent cases and in the tertiary cases is eleven months and sixteen and a half months respectively. Thus an accurate statement as to the extent of one's ability to cure the disease in these stages can be made only after an analysis of a number of cases which have been under treatment for periods of nineteen months for the latent stage and twenty-seven months for the tertiary stage

THE MANAGEMENT OF DISCHARGING EARS IN CHILDREN

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THE reason for this communication lies in the fact, that the subject of discharging ears in children has not received the attention which its importance warrants. The experience of the clinics emphasizes the need for some statement, based upon extensive observation, that may be used not only as clinical information, but as a guide in the direction and care of such cases.

The danger of cranial complications in chronic ear disease of adults, has been repeatedly pointed out, and although these same complications exist in children, it is from the standpoint of the child's hearing that this subject is of such great importance. Chronic discharge means more or less permanent deafness, and a deaf child is unable to obtain a proper education. He becomes handicapped from the very start, and suffers throughout life from inability to compete with those of sound hearing. It is hoped that the following remarks, though of necessity general in nature, may help in establishing a more logical attitude towards this important subject.

It may be necessary at the outset to alter one's conception of the pathology, for many fanciful ideas are in existence. An uncomplicated acute suppurative otitis media, in which adequate drainage has been effected, either by nature, or by incision, is an inflammatory process which can well attend to itself. It resolves after a time varying from a few days, to two or three weeks, occasionally longer, depending mainly upon the general condition of the patient.

If an acute case does not recover within this variable time limit, then one may take the point of view that there is some condition, other than in the middle ear(though this is not always the case) which is responsible. It then becomes necessary to find out what this condition is and, by correcting it, ensure healing of the ear before any damage to health, or hearing, has taken place. By adopting such an attitude, discharging ears will not be allowed to become chronic and the subsequent dangers and disabilities will be eliminated. All of these can be prevented if patients, or the guardians of patients, are properly advised at the proper time. It does not seem to be realized, that ears allowed to continue discharging are progressively losing their function, and that further serious trouble may be progressing inside, irrespective of external appearances. The important factor in the care of an acute case is not in local treatment, but in general medical attention and observation.

There is a wide-spread feeling that the popular treatment of syringing out the meatus with boracic solution is the best and only thing to do. So far as can be made out, assiduous measures so directed, have no favourable effect; nor would one expect them to have. It is far safer to do less and watch more. As the infection comes from the post-nasal space, measures directed towards making that more healthy are more logical. The harm from the use of boracic, arises not from any property of itself, but in the unbounded, and unwarranted faith in its efficacy, and the continuance of its use long after other measures should have been adopted.

Descriptions of local appearances, and of the various types of discharge which one finds, are beyond the range of this paper; they vary with the virulence of the causative organism and the stage of the inflammation. It should be noticed, however, that it is mucous membrane which is mainly involved, and the manifestations will be similar to those of any inflamed mucous membrane. The temporary deafness gradually disappears with resolution. One would not expect immediate restoration of hearing, with the cessation of discharge.

The common conditions responsible for the continuance of the discharge after the acute stage are not many, and they may act alone, or in combination with each other. They are:—

(1) A devitalized condition of the patient, from any cause. (2) An inflammation in the naso-pharynx, associated with the presence of adenoids, chronic rhinitis with hypertrophy, or diseased tonsils. (3) Concomitant inflammation of the mastoid antrum and cells.

Mastoiditis may occur at any age, for the antrum is present at birth. Clinically, this involvement may be of two types, one in which erosion of the superficial bone takes place, giving rise to a periostitis, with or without a subperiosteal abscess. The signs of this type are almost impossible to miss on examination. The other type is that in which there are no external signs. In this there may be nothing external to suggest mastoiditis, for the drainage is so free from the antrum into the middle ear, and thence to the outside, that there is not the tendency to spread outwards as in the former. The diagnosis often is difficult and that is why it is so frequently overlooked. If the discharge continues it is wrongly called a chronic otitis media, when it is, in reality, a chronic concealed mastoiditis draining through the middle ear to the outside.

When there is involvement of the mastoid, it probably takes place at the same time the middle ear is infected. If it is going to show itself externally, sufficient time must elapse for the infection to reach the periosteum. This time will be less in infants, as the autrum in them is very close to the surface; as growth proceeds, more and more bone is deposited on the outer side of the antrum, so that it comes to lie farther and farther from the surface. In older children it is rare to have external signs before twelve or fourteen days have elapsed.

One cannot judge from the surface what is going on underneath. Often the cases looking the worst outside, are the safest inside, and *vice versa*. In a type marked by the formation of cholesteatoma, progressive erosion of the bone may take place in any direction. Eventually, secondary infection takes place with serious consequences.

The suggestions I am about to offer in the care of these cases, are based upon the routine procedure established in the ear clinic at the Hospital for Sick Children. Here the attempt is made to control all acute cases, in such a way, that none will be allowed to progress to chronic conditions.

In cases seen at the onset of an acute attack, in which the drum membrane has commenced to bulge in the upper, posterior part, an incision is recommended, made preferably under ethyl chloride general anaesthesia. This incision must be adequate and if the mucous membrane in the region of the aditus be much swollen, it should be incised as well. A mere stab of the drum is not sufficient, it may only give temporary relief and in closing permit a recurrence of the symptoms. If an adequate incision be made, there is no call for any repetition. If symptoms should arise suggesting inadequate drainage, the cause lies deeper, and will not be improved by re-incision. This statement needs emphasizing, for much permanent damage to ear-drums has been done by unnecessary repeated incisions. After adequate incision, general medical attention is the main need, in which a careful watch is kept of the course of the inflammation. A simple and safe way of cleansing the ear is to wipe out the meatus occasionally with pledgets of dry cotton, leaving a loose piece over the opening, to be changed when soiled. For the post nasal space, a few drops of liquid paraffin alone or combined may be dropped into each nostril, (the patient lying on his back) and allowed to run backwards. This acts mechanically in helping to clear away the accumulated secretion. In cases already discharging when seen, for future reference a note of the date of onset is important. Usually the drainage made by nature is sufficient, but the question of incision must be decided by the individual factors in the case.

Should the case not recover in a reasonable time, a careful examination should be made for the presence of any complication or impairment of general health which may be preventing the healing; this detailed examination will usually reveal the cause, and this cause should be attended to in the most efficient way. Superficial tenderness over the front part of the tip of the mastoid is very common in the first few days, and signifies little; deep tenderness over the antrum in the second or third week is most significant of trouble inside.

If there are no external signs of complication, active inflammation in the ear in the third week, as shown by pulsation of the discharge (transmitted from the dilated vessels) or a profuse discharge out of all proportion to the capacity of the middle ear usually means concealed mastoiditis. Sagging of the posterior superior wall of the meatus, an evidence of inflammation of the bone adjacent, is not always present in mastoiditis. The persistence of fever may be valuable evidence, though if drainage be free, there may be extensive involvement with little change in temperature.

It is impossible to give general directions to fit every case. Each must be studied independently, from the fullest local and general information obtainable. In many cases the diagnosis must rest upon fine points, which perhaps would be unnoticed, except by one with extensive experience in this work. In cases which have unfortunately become chronic, there is only one course to take—to place them under observation until a detailed diagnosis has been made, and then attempt to correct the condition.

It has been pointed out that most of these cases are not chronic otitis media, but chronic concealed mastoiditis, and operation seems to be the only satisfactory way of dealing with them. There is no one set type of operation that will do for all cases. Each must be studied individually, and the nature of the operation performed will depend upon the necessities of the case. It seems, however, a great pity that so much of this trouble should exist, and so much time should be taken in repairing what need not have taken place. Prevention can be ensured by controlling all acute cases, and the carrying out of this control will demand much patient work for a number of years.

In this effort it is essential to have the understanding and the help of the profession, who, it is hoped will be in a position to give sound advice, and it is also essential that the laity be provided with sufficient information of the nature of the trouble, to lead them to seek that advice early.

I close this paper by adding a copy of the information given to the parents or guardian of every ear case coming to the clinic.

> A discharge from the ear is the result of an abscess. In most cases this abscess is located in the middle part of the ear internal to the ear drum, and is caused by germs which make their way through a small passage from the space behind the nose. There is usually a great deal of pain, until it is relieved by a discharge making its way through the ear drum, and appearing at the opening of the ear. This abscess is located in that part of the ear which carries the sound, and always causes temporary deafness. If the discharge is allowed to last more than a few weeks, this deafness will become permanent, and a slow destruction of the ear will set in, possibly leading to very serious complications. The longer the discharge is allowed to go on, the greater the destruction, the greater the degree of deafness, and the more difficult it becomes to right the condition. Deafness prevents a child from being properly educated, and so prevents him when he grows up from being able to earn a proper living, and taking his proper place in the community. Do not neglect your child, thinking he will grow out of this. You are allowing the ear to become damaged beyond repair. Report it at once, as soon as you know of an earache or discharge. If attended to early and properly, this trouble can be cured before any damage is done. You cannot afford to let your child become deaf, or to have diseased ears.

A NOTE ON THE PHOSPHATE CONTENT OF THE SERUM OF CASES OF BONE TUBERCULOSIS TREATED BY HELIOTHERAPY[*]

Frederick F. Tisdall, M.D. (Tor.) and Robert I. Harris, M.B. (Tor.)

THIS note is published to report the result of an investigation of the mechanism of the curative action of sunshine in cases of bone tuberculosis. While the results of the research have been negative, it is felt that they should, nevertheless, be recorded.

It has been demonstrated with reasonable certainty that heliotherapy is of greater value in the treatment of tuberculosis affecting bones than it is in the treatment of tuberculosis affecting soft tissues. Influenced by the recent work on the problem of rickets, Harris[1] advanced the suggestion that the superior efficiency of sunshine in cases of bone tuberculosis might be due to an action upon the phosphate metabolism similar to that occurring in rickets, which favoured the deposition of new bone in the focus of disease, and thus produced a cure. It will be recalled that infants suffering from rickets display as one of the most striking symptoms, evidences of marked impairment of the power to form bone. The epiphyseal lines show a characteristic disturbance and radiographs or microscopic sections of such diseased epiphyses show that the pathological condition is due to a marked deficiency or absence of bone salts. At this stage of the disease, the blood, as has been demonstrated by Howland and Kramer[2], Hess and Gutman[3], Tisdall[4] and others, is poor in one of the elements which was necessary for the formation of bone, *viz.*, phosphorus. When these patients are exposed to sunshine, the impaired osteogenetic power of the individual is restored. This is evidenced by the deposition of bone salts in the epiphyseal lines. At this stage the phosphate content of the serum is found to be markedly increased.

The cure of foci of tuberculosis in bones is effected or at least accompanied by the deposition of new bone in the diseased area. It is customary to judge the progress of such cases by examining the evidence of radiograms in an effort to determine the amount of new bone laid down. In view of the osteogenetic action of sunshine in rickets, it was not unreasonable to assume that the mechanism of the curative action of the sun's rays in bone tuberculosis might be of a similar nature and that the concentration of the inorganic phosphorus in the blood serum during the curative stage might be found to be increased.

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[*] From the Laboratories of the Hospital for Sick Children, and the Departments of Pediatrics and Surgery, University of Toronto.

The phosphate content of the serum of a series of patients suffering from tuberculosis was examined before and after varying periods of heliotherapy. Three patients with bone tuberculosis (one Pott's disease, one sacro iliac disease and one tuberculous hip) and three cases with soft tissue tuberculosis (two tuberculous peritonitis and one tuberculosis of thigh) constituted the first series.

Table I

Concentration of the Inorganic Phosphorus in the Serum of Patients suffering from Bone and Soft Tissue Tuberculosis, undergoing Heliotherapy.

Case No.	*Age Years*	*Before Treatment, May 26*	*After 150 hrs. exposure to sunlight, July 17*	*After 295 hrs. exposure to sunlight, Sept. 6*	*Present clinical condition*
		mgms P. per 100 cc. of serum	mgms P. per 100 cc. of serum	mgms P. per 100 cc. of serum	
1	38	4.0	4.1	3.0	convalescent
2	27	4.1	4.1	3.0	cured
3	29	3.8	4.1	—	unchanged
4	30	4.1	4.7	4.1	very much improved
5	33	4.3	4.0	3.5	convalescent
6	29	4.7	—	3.9	very much improved

Cases 1-3 are cases of soft tissue tuberculosis

Using the method described by Tisdall[5] the phosphate content of their serum was determined, (a) before instituting treatment, (b) after 150 hours' exposure to sunlight administered over fifty-two days and (c) after the further administration of 145 hours of sunlight in a second period of fifty-one days. The results are recorded in Table I. All these patients made definite clinical improvement except Case 3, and in addition x-rays of the bone cases showed evidences of new bone formation.

A second series of determinations were made on patients all of whom were suffering from bone tuberculosis. The patients had been exposed to sunshine during a whole summer (350 hours). These results are recorded in Table II. During the period covered by these observations all the patients made definite clinical improvement. In addition radiograms showed signs of local healing as indicated by the deposition of new bone.

Table II

Concentration of the Inorganic Phosphorus in the Serum of Patients suffering from Bone and Soft Tissue Tuberculosis after 350 hours' exposure to sunlight.

Case No.	*Age Years*	*Mgms. per 100 cc.*	*Present clinical condition*
7	23	3.4	cured
8	31	3.2	very much improved
9	27	2.5	very much improved
10	33	2.6	convalescent
11	29	2.8	convalescent
12	27	3.4	very much improved
13	23	3.9	very much improved
14	25	2.8	very much improved
15	27	3.6	convalescent
16	28	3.9	convalescent
17	25	3.4	convalescent
18	26	3.2	very much improved

The inorganic phosphorus content of the serum of normal adults varies from 3.5 to 4.0 mg. per 100 cc.

From the results recorded in Tables I and II, it is apparent that the deposition of new bone which occurs during the cure of bone tuberculosis is not accompanied by an increase in the inorganic phosphate content of the blood serum such as occurs during the cure of rickets. In many cases the concentration of phosphorus was found to be actually below that present in normal serum. No increase was found to occur in the inorganic phosphate content of the serum in three cases of soft tissue tuberculosis, two of whom were improved by treatment.

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SUPPLEMENTAL FEEDING IN GASTRO-INTESTINAL DISTURBANCES OF THE BREAST FED INFANT*

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WE are all agreed that, in the feeding of infants, breast nursing is paramount. It is only when this fails in its perfect functioning that other means are necessary to maintain the comfort and general well-being of the infant. Many infants, when gastro-intestinal disturbances arise, are taken from the breast and fed artificially. Many of these may be kept at the breast and their comfort and health improved by judiciously supplementing the breast feeding.

For the sake of discussion, permit me to offer a simple classification of these disturbances: (1) Dyspepsia; (2) Constipation; (3) Vomiting; (4) Diarrhoea.

We are all acquainted with the dyspeptic breast fed infant and the frantic desire of the members of the household to have something done to relieve its distress. Some of these cases respond to the simple procedure of lengthening the period between nursings and cutting down the time at the breast. In others, the child is little, if any, improved, and the loss of function of the breast may be threatened, or a child crying from hunger may confuse the result. These children are usually vigourous, greedy babies. Numerous green stools with mucous and fat curds showing, are passed. In this type of case supplementing part of each nursing will give good results in the majority of cases when weaning from the breast would seem almost a necessity to bring about this result. It is obvious that the bottle feeding must be given before each nursing, must not excite further any of the symptoms present, must tend to offset the fermentation in the intestine, and take the nip off the greedy baby's appetite. Protein milk of Finklestein and Meyer, the formula used in most children's hospitals, fat 1.5; sugar, 1.5; protein, 3.3, is the feeding of choice. Full strength may be used except in very young infants, where it may be necessary to use two-third's strength. The amount given before each nursing is, one-quarter to one-third the estimated amount of food the child takes at a feeding. Protein Milk Powder, as prepared by the Canadian Milk Products Co., has been used with encouraging results in cases that live outside the city, although its higher sugar and fat content renders it less efficacious than the former. Its use may be recommended to physicians in rural districts and small towns who are not in touch with a feeding laboratory.

One finds that, in the majority of cases, as the infant grows older, and the mother's health is improved by full simple diet, plenty of exercise and unbroken sleep, the protein milk feedings may be gradually discontinued and uneventful breast feeding carried on until weaning time.

Three forms of constipation are worthy of discussion under this heading:

(1) Constipation due to high fat content of the food.

(2) Breast milk scanty or low in solids with little residue.

(3) Obstinate constipation in both mother and babe.

The first form, rarely seen in the breast fed infant, corresponds somewhat to what we know as weight disturbance in bottle fed infants. The stools when passed are hard, grey and crumbly, the so-called soap stool. The infant is usually cross and irritable and may show signs of exudative diathesis. Supplementing part of each breast feeding with a low fat cow's milk formula with malt sugar added has been found useful in combating this condition. In constipation due to breast milk low in solids, either supplemental or complemental feeding obviously will bring about an improvement and may be recommended without criticism.

Some observers are of the opinion that obstinate constipation in both mother and babe is coincident and bears no relationship to one another. It is very difficult to believe this, when the conditions are so frequently seen together, and no other cause can be found to account for the trouble in the infant. Several cases of this type have come under our observation recently. Improvement in all was brought about by feeding a cow's milk mixture with malt sugar added, before each nursing. The quantity being about one-third of the estimated amount taken by the infant at a feeding, *i.e.*, infant five and one-half months old, weight, fourteen lbs., estimated quantity taken at nursing, seven ounces. Feed baby two and one-half ounces cow's milk formula before each nursing.

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*Read at the Ontario Medical Association, Toronto, May 1922.

Physicians for some time have endeavoured to connect two types of vomiting in breast fed infants by supplementing part of each breast feeding with thick cereal mixtures. The two types are known as habitual vomiting and rumination. Some cases of the former type may be improved by this method, provided the infant is past the age where starch in large quantities would be poorly handled by the gastro-intestinal tract. The latter condition is not a common one in breast fed infants. Whenever it does occur, if we wish to keep the child at the breast, in supplementing part of each breast feeding with thick cereal mixtures lies our only hope of improving a habit that may have very serious consequences on the nutrition of the infant.

A type of diarrhoea with a passage of eight or ten green frothy stools daily is seen sometimes in breast fed infants with neurotic mothers. This is believed to be due to some temporary change in the breast milk and is not an uncommon thing in this high tensioned age. It may occur during the period of menstruation or at any time the mother is worried, fatigued, or otherwise upset. It is further aggravated when the symptoms appear to be induced by the fear that she is not going to be able to nurse her infant. Whether this disturbance occurs at the menstruation period or at regular intervals, supplementing part of each nursing for a few days with protein milk preferably, or a simple cow's milk formula without the addition of sugar, not only improves the diarrhoea, but heightens the mother's confidence in her ability to successfully nurse her infant.

The rôle of supplemental feeding in an endeavour to correct the gastro-intestinal disturbances of the breast fed infant, while not a great one, possesses value in a certain number of selected types of cases.

THE TESTING OF CLINICAL THERMOMETERS

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THE clinical thermometer is probably the most extensively used instrument in the science of pathology. Not only is it employed by the medical practitioner himself but it is an almost indispensable possession of every household. When, in addition to the large number of clinical thermometers in daily use, their somewhat fragile nature is considered, it is readily seen that in Canada alone many thousands of these instruments must be sold annually.

The clinical thermometer is an inexpensive, widely manufactured article; at the same time it is expected to give temperature readings with an accuracy comparable to that of the more expensive mercury thermometers used in scientific laboratories. No physicist, working in one of these laboratories, would dream of using his thermometer for making accurate temperature measurements unless he knew to what extent, if any, it varied from the accepted standards by which temperatures are measured. Even then he would check his thermometer from time to time, knowing that the indications of the instrument are liable to change. This is especially true when the thermometer is new.

These same considerations apply to clinical thermometers, especially when it is desired to obtain very accurate measurements of the body temperature. For this reason, the large national testing laboratories—such as the Bureau of Standards of the United States of America, or the National Physical Laboratory of England—undertake the certification of clinical thermometers at a nominal fee, rendered possible by the large number handled annually.

The experience of Great Britain during the late war, in this connection, is very interesting Before the war the number of clinical thermome ters tested yearly by the National Physical Laboratory was about 20,000. These were mostly submitted by firms desirous of obtaining certificates showing the accuracy of their instruments. Early in 1917, when the Government was purchasing large numbers of these thermometers for use in army hospitals, it was found that many were inaccurate or otherwise unreliable. Arrangements were therefore made for the Laboratory to test thermometers purchased by the Government, and later, an Order-in-Council was passed making it compulsory that all clinical thermometers should be tested and passed before being offered for sale, whether for Government or for private use. A charge of six cents each was made for the test, the Laboratory testing as many as one and one-half million instruments a year.

When the tests were commenced, over five per cent. of the thermometers were rejected (in the case of some makers the rejections amounted to forty or fifty per cent.) but after the makers had discussed their difficulties with the Laboratory officials the standard improved, and the average rejection percentage is now less than two. Some English manufacturers regularly have less than one-half of one per cent. rejected, but the Laboratory states, on the other hand, that in one year over thirty per cent. of non-British clinical thermometers failed to pass the test. It may be mentioned that to pass the National Physical Laboratory test a clinical thermometer must not be in error by more than 0°.2F. up to 106° F. Above this point an error of 0°.3F. is allowed.

A legal limit for the errors of clinical thermometers (including also thermometers to measure the temperature of animals) is in force in the State of Massachusetts. Here the practice differs in some respects from that just described, in that manufacturers (under suitable bonds and other safeguards) are allowed to certify their own thermometers. Penalties are established for the sale of inaccurate thermometers, and generally the requirements of the law are severe.

The Bureau of Standards of the United States has drawn up tolerances for clinical thermometers, which are being investigated by various States of the Union, with the idea of introducing uniform laws governing the sale of these thermometers. The Bureau also, as stated above, undertakes the certification of clinical thermometers on request.

Owing to the insistence of certain governments for proper certificates, and also to give an appearance, at least, of a form of guarantee, it has become the practice of many manufacturers to issue certificates of their own with clinical thermometers. In some cases, where firms of good repute are concerned, these certificates may be reliable, but unfortunately this is by no means always the case. Thus it is unwise to place much confidence in the certificate accompanying a clinical thermometer, unless issued by an independent government laboratory. Cases are known of thermometers, certified as having no error at any part of the scale, showing under proper test, discrepancies of several fifths of a degree. There is another feature of this practice, about which physicians and the public generally should be warned. Certain makers of thermometers, sold in Canada, issue certificates with the words "Bureau of Standards" printed in large type and in such form that at first glance it may appear that the thermometer is actually certified by the Bureau of Standards, when this is not the case.

Canada has no regulation governing the sale or testing of clinical thermometers. These instruments, however, are certified on request, by the Surveys Laboratory of the Topographical Surveys Branch, Department of the Interior, Ottawa. The Laboratory has a well equipped thermometry division, where thermometers of various kinds are tested and certified, the equipment including special appliances for dealing with small thermometers of the clinical type.

At the Surveys Laboratory the test of a clinical thermometer consists in comparing its indications with a standard thermometer (which is checked periodically in terms of the Standard Temperature Scale), testing it for retreating or other mechanical faults and for the ease with which the index can be shaken down.

Comparisons are made in a bath with the water in constant circulation, its temperature regulated electrically. The thermometers are read at every 5°F. between 95° and 110° inclusive, and also at one-fifth of a degree above each of these points. The reason for this latter reading is to detect irregularities due to excessive constriction in the bore, etc., which would show themselves by inconsistent readings at the two points one-fifth of a degree apart. In order to test the retreating tendency, a reading of the thermometer is first taken while it is immersed in the bath, the temperature is then suddenly lowered several degrees, and the instrument again read. Any clinical thermometer not maintaining its former reading is rejected. Ability to shake down readily is tested by whirling the thermometer on a centrifuge. Any thermometer failing to shake down, when a predetermined speed is reached, is refused a certificate. These tests are made to batches of forty-eight thermometers at one time, and can be conducted very quickly, so that if thermometers are sent in sets of twelve or more the fee is only five cents each.

The maximum error of reading allowed in a thermometer awarded a certificate is one-fifth of a degree for temperatures up to 105°F. and three-tenths of a degree for higher temperatures. In addition, thermometers receiving certificates must be free from mechanical and other imperfections and successfully pass the "retreating" and "shaking down" tests.

THE LIMP OF CHILDHOOD—A CLINICAL LECTURE

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THE limp of childhood constitutes a problem which has frequently to be solved by medical practitioners. The parents are naturally terrified at the prospect of their child becoming a cripple; the young doctor's reputation often depends upon the success with which he handles the case; and the youthful patient himself might well tremble could he but appreciate how the life-long integrity of limb depends upon the skill of the physician consulted.

At the outset it is important to obtain a careful history of the case. Almost invariably trauma, sometimes remote and not of a serious nature, is brought forward as the cause. Inquiry is to be made on the following lines:—

(1) Any definite trauma, preceding the limp by not more than a month or two.

(2) The existence of pain; its site, duration, and character; or

(3) Of any antecedent paralysis of any kind.

(4) The duration of the limp, whether from the beginning of walking or of more recent origin.

(5) The history of infectious disease preceding the discovery of the limp, whether infantile paralysis, measles, chicken pox, pneumonia, scarlet fever, etc.

(6) The existence of any deformity or swelling noticed by the parents in the spine or leg.

The child should then be stripped and made to walk in a good light towards the examiner as well as across his line of vision. Verify the presence of a limp and note whether it is on one or both sides. Look for stiffness of movement in spine, leg, or foot: for the presence of redness, swellings, scars or sinuses, deformity, muscular atrophy, or hypertrophy. In the spine examine for the presence or absence of lateral or of angular curvature. In hip and knee note whether flexion deformity exists. Do the gluteal muscles show wasting? Look for a drop foot, a short tendo Achillis, a genu recurvatum or a pes planus. Does the child toe in or out as it walks: is the gait waddling or stiff? Have the child stoop to the floor and note the curve of the spine and the manner in which it recovers the erect position. Note any habit of supporting spine or legs with the hand. Follow this by placing the child on the examining table or floor, not on a soft couch or bed, and go over the movements of the spine and legs, noting particularly any restriction of motion, which is by far the most important sign of joint disease. Thomas' test for restricted extension of the hip should not be omitted. It will be recalled that in this test the sound thigh is pressed against the body until the spine lies flat on the table. If in this position the thigh on the side under examination cannot be laid flat on the table without difficulty or pain it may be said that hip extension is restricted. During these tests for movement one should look for muscle spasm. Often the child, in its own unsolicited movements, will reveal guarded action in some joint.

Palpate the spine for tenderness, for beginning kyphos, for abscess formation, for fluctuation. Palpate the iliac fossae for the fulness of psoas abscess, the groin for enlarged glands. Feel if the head of the femur is in place, if the great trochanter is higher than it should be according to Nélaton's line if there is any thickening or induration about the joint. Is any paralysis present? Compare the length of the legs by careful measurement from the anterior superior spines to the internal malleoli. Measure for thigh atrophy at equal distances below the anterior superior spines; the calves as well. In the case of the latter one should measure at their point of greatest development. Examine for tenderness over the femoral head and the great trochanter, and ascertain whether jarring the hip joint causes pain.

Palpate the length of the femur for thickening or irregularity, the knee joint for effusion or enlargement, the epiphyseal and joint lines for tenderness. Does undue surface heat exist anywhere? Are the various muscle groups of normal strength? Is the knee joint relaxed, permitting backward bowing? Palpate the tibia for irregularities or tenderness, the foot for abscess formation, limited or painful motion, and for tenderness whether of ankle joint, scaphoid, calcaneal epiphysis, or tarsus generally.

In arriving at a *diagnosis*, stiffness of spinal movements together with muscle spasm are indicative of arthritis, and of the various forms that due to tuberculosis is the most frequently encountered and the most to be dreaded. The discovery of localized tenderness or of a beginning angular curvature will make the diagnosis more clear. Fulness in the iliac fossa with restricted hip extension (Thomas' test) constitutes valuable evidence of psoas abscess. Lateral curvature sufficiently marked to cause a limp is likely due either to infantile paralysis, in which case the history will help, or to congenital malformation of the vertebral column, for the diagnosis of which the x-rays are necessary. In all early cases of bone disease, tuberculosis or otherwise, the x-rays are of little assistance. In the hip joint everything centres about tuberculosis. In a suspicious case showing limited motion, muscle spasm and joint tenderness, it is a safe plan to keep the child at rest for a couple of weeks. If the signs persist after this rest, one may assert that some form of chronic arthritis is present, of which tuberculosis is the most common. Night cries and an evening temperature are valuable confirmatory evidence. There is a form of non-tuberculous hip arthritis which simulates a mild tuberculosis arthritis, and which can be differentiated only by the x-ray findings. This benign arthritis is called pseudo-coxalgia or caput planum (Legg-Calvé) from the flattened appearance of the femoral epiphysis in the x-rays. This may also show fragmentation and the neck of the femur will probably show thickening.

An infectious arthritis may follow measles, chicken pox, pneumonia, scarlet fever, etc. Still's disease, a form of multiple arthritis of unknown origin, is seen in childhood and may cause a limp. It is to be recognized by the presence of swellings and limited movement in other joints, especially the fingers, and by general glandular enlargement. Syphilitic hip disease is to be suspected in the presence of general signs of congenital lues. Suppurative arthritis or epiphysitis of infancy leaves, when recovered from, a deformed and dislocated hip joint, together with scars and a suggestive history.

A mild osteomyelitis about the hip may simulate tuberculosis. It is usually to be differentiated by the x-rays, an examination of the pus, and sometimes by the presence of unmistakable lesions elsewhere in the body.

The presence of coxa vara, whether due to separation of the capitellar epiphysis or to rickets, etc., will be shown by the fact that the femoral head is in the acetabulum while the great trochanter rides high.

The diagnosis of knee conditions is, as a rule, less complicated. Tuberculosis, as at the hip, forms the central point of our investigation. A chronically swollen joint with increase in the surface heat and tenderness at the lower epiphyseal line of the femur is very suggestive of tuberculous infection, especially when following trauma. Beware of syphilitic arthritis and sarcoma, both of which are a frequent cause of error. A syphilitic knee joint may be suspected by the presence of periosteal thickening as seen in a skiagraph, by the presence also of an interstitial keratitis, of Hutchinson's teeth, etc., and will be confirmed by a positive Wassermann test and the usually speedy cure obtained by antiluetic treatment. In the case of sarcoma the diagnosis is perhaps to be cleared up most expeditiously by the early removal of a specimen for microscopical study.

Paralysis of the quadriceps (poliomyelitis) is usually manifested by a habit of supporting the knee with the hand while walking, and the deformity of genu recurvatum as a rule indicates weakness of the hamstring muscles. Tenderness at the insertion of the patellar tendon in a child is suggestive of an epiphysitis of the tubercle of the tibia, the so-called Osgood-Schlatter's disease. This runs a benign course.

In the foot the swelling and sinus formation and tenderness of tuberculosis, syphilis and suppurative osteomyelitis are to be sought for. Paralytic and congenital deformities are easily recognized. Limitation of motion in the foot, if unaccompanied by pain, usually means old healed bone disease. As a rule such a foot will show deformity at one side or the other. A short tendo Achillis should be sought for, as being a frequent cause of limp. A flat foot, also, may cause a child to limp, and when this deformity is marked it is well to suspect infantile paralysis. When a child's flat foot is accompanied by marked tenderness over the scaphoid bone, one should suspect the disease known as scaphoiditis or Koehler's disease. This lesion is non-tuberculous; is limited strictly to the scaphoid in the x-ray picture, and runs a benign course. It is probably infectious in origin and is to be differentiated from tuberculosis by the fact that in the latter disease the x-rays show the lesion spreading to the contiguous bones. A lesion probably akin to scaphoiditis manifests itself by pain and tenderness on either side of the heel, at the site of the epiphysis of the os calcis. This disease also is of unknown origin, runs a benign course of several months, and is the result of an epiphysitis of the posterior part of the os calcis. If marked. it may show x-ray changes.

After-care of Infantile Paralysis Cases of the 1916 Epidemic in Brooklyn. — Horace G. Dunham, Brooklyn, urges that, during an epidemic of infantile paralysis of any size, children with obscure indisposition should be kept at rest in bed for several days until the exact nature of their condition can be determined. When paralysis supervenes, it usually appears within a very short time after the initial upset, the average in a series which was investigated being three days after the first manifestation of illness; but often the paralysis comes on twenty-four or forty-eight hours after, so that the patient with a malaise of no consequence need not be incapacitated over a long period of expectancy. Early, neglected patients should never be ignored in treatment later, regardless of the degree of involvement. It is essentially a disease of childhood, therefore in every obscure, acute illness the diagnosis of infantile paralysis should always be a mental reservation, since sporadic cases occur in the community every year. Obviously, to obtain the best results and maximum functional return, these patients must have intelligent care from the outset of their illness. Correct treatment for a definite stage applied at the wrong time is far worse than none, just as surely as exercise pushed to the point of fatigue and muscle exhaustion is distinctly harmful.—*Jour. Am. Med. Ass.*, January 27, 1923.

Transplantation of Tensor Fasciae Femoris in Cases of Weakened Gluteus Medius.—The limp caused by a weak gluteus medius, with marked swaying of the body toward the involved side, and dropping of the hip on the opposite side (Trendelenburg sign), is very noticeable in many cases of poliomyelitis. In the endeavor to alleviate this limp, Arthur T. Legg, Boston, devised the plan of transplanting the tensor fasciae femoris muscle into the outer side of the femur to increase the abductor power, diminished by the loss of power in the gluteus medius. So gratifying have been the results of this operation that he has performed fifteen such operations with very satisfactory results in most cases. The Trendelenburg sign has disappeared, and the lateral swaying of the body has markedly diminished, if not disappeared.—*Jour. Am. Med. Ass.*, Jan. 27, 1923

Case Reports

FOUR CASES OF BRONCHOSCOPY (INCLUDING TWO OF LUNG ABSCESS)

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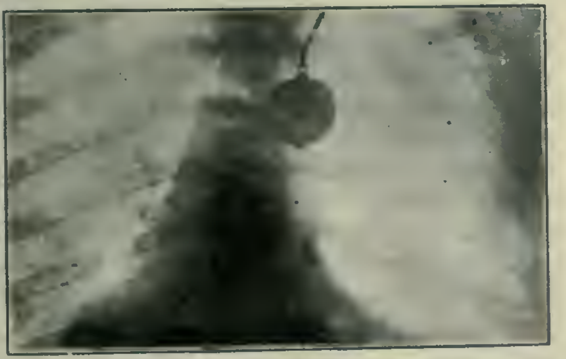
Among the endoscopic cases which have recently come under my observation, exclusive of the frequent swallowing of the large Canadian cents, I have selected four examples of bronchoscopy, not only on account of their intrinsic interest, but because they emphasize a point to which I especially wish to call attention.

Before the days of bronchoscopy, we literally groped in the dark, and fished blindly for foreign bodies through a tracheal opening. This was all changed by the discovery of the x-ray and the bronchoscope, and in the majority of our cases, having accurately located the intruder, we were able to grasp and withdraw it with more or less precision. In certain cases, however, much difficulty was encountered. A change of position of the foreign body, or the presence of inflammation, ranging from stenosis to abscess greatly complicated the process, and only in the hands of a master such as Chevalier Jackson were the results satisfactory.



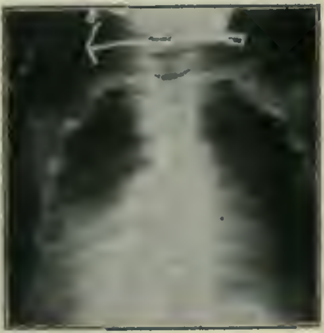
Radiograph by Dr. Colin Ross, showing crown of tooth with abscess cavity.

The fluoroscope again marks a distinct advance in endoscopic surgery. This is the feature that I wish strongly to emphasize. Not only does the fluoroscope visualize and greatly expedite the proper treatment of the foreign body, constantly illuminating its location and position, but with its aid it is seldom necessary to resort to inferior bronchoscopy.

In the first of the cases that I wish to report, the use of the fluoroscope was unnecessary. The second case was attempted without its aid, but I was obliged to call in its assistance. With the third and fourth cases I am doubtful whether I could have succeeded without it.

Case I came to my clinic at the Western Hospital; a child, three and one-half years old, who had swallowed a scarf pin containing a large stone. It was lodged point upwards in the middle branch of the right bronchus and had been in this position for twenty-four hours. From the x-ray picture, the radiographer thought it might be in the esophagus. The esophagoscope was, therefore, first passed to make sure that this was not the case. I then proceeded with superior bronchoscopy and fortunately was able to locate the pin and remove it with suitable forceps at the first attempt. The operation lasted but a few moments. Ether was the anaesthetic given. I used a 5 m.m. tube. The child had no symptoms except a slight cough.

Case II was that of a child of seven years referred to me by Dr. Gordon Campbell from the Children's Clinic of the Montreal General Hospital. She had been ill for seven months suffering from lung abscess simulating tuberculosis. The x-ray revealed a shingle nail situated in one of the branches of the right inferior bronchus in the centre of a large abscess cavity. The child was pitifully emaciated; had a septic temperature; suffered from night sweats, and coughed constantly expectorating foul-smelling pus. We attempted to remove the nail, but after forty minutes spent in unsuccessful search we were obliged to desist on account of the child's condi-



Radiograph by Dr. W. A. Wilkins, showing nail in right bronchus.

tion. Four days later we made another attempt, this time with the aid of the fluoroscope, which enabled us to locate the nail and withdraw it in a few minutes time. A 5 m.m. tube was used and ether was the anaesthetic administered. The abscess cleared up in about two weeks.

Case III was that of a woman of thirty, the victim of a peculiar accident. The patient gave the following history: while dining at a restaurant on February 21st, 1920, a small, white-headed pin fell from her hat between her face and veil and into her mouth. A sharp, pricking sensation caused her to inhale quickly and the pin was drawn into the trachea. It lodged in the inferior branch of the right bronchus as shown in the x-ray plate. At first the patient had no symptoms; but feeling nervous after her experience, she consulted the family physician on February 23rd, two days after the accident. The doctor's examination of the nose and throat was negative and he assured the patient that he found no evidence of trouble. As there were no symptoms of bronchial irritation the chest was not examined. On the following day she developed a slight cough and a feeling of constriction in the neck immediately above the sternum, but on drinking water this sensation disappeared. In the evening another paroxysm of coughing occurred accompanied by a sensation of smothering; the patient ran into the street for air, and again the symptoms subsided. This condition was probably brought on by coughing which dislodged the pin and forced it up against the subglottic portion of the larynx. This condition sometimes causes asphyxia from spasm, but fortunately in this case, the pin fell back into the bronchus. The patient once more consulted her physician who advised her to have an x-ray taken. This was done the next day by Dr. Wilkins, of the Montreal General Hospital. The plate revealed the presence of a pin about two inches long with a round head the size of a small pea lying in the position already described, point upwards. The only symptoms were an occasional cough associated with dyspnoea. As the patient refused to have the operation done under local anaesthesia, ether was administered, and the pin removed with the aid of the fluoroscope; during the removal I was ably assisted by Dr. Wilkins. To diminish shock and control the bronchial secretions the patient was given one-quarter grain of morphine with atropin 1/150 gr. half an hour before the operation.

The interesting features of this case are: The unusual circumstances under which the pin found its way into the patient's bronchus; the negative findings in the physical examination, and especially the valuable assistance of the fluoroscope in locating the pin, and enabling the operator to grasp it with precision and facility, thus saving unnecessary groping.

Case IV was that of a woman, aged forty, who was referred to me by Dr. Charles Vipond, who stated that his patient had had an abscess of the lung for the past year and a half. She had been a patient in two other hospitals, and was finally taken to the Western Hospital where the x-ray disclosed the presence of a foreign body in the inferior branch of the right bronchus, close to the arching dome of the diaphragm near the spine. The abscess had been drained by the external route, but as her condition did not improve I was requested to see the case. The foreign body proved to be the crown of a posterior molar tooth swallowed in a dentist's chair a year and a half previously. I decided to do a bronchoscopy, and a suitable table was specially constructed in the x-ray room to get the maximum fluoroscopic result. The table was tilted at an angle of forty-five degrees in order to facilitate drainage. The x-ray tube was placed thirty-four inches from the chest wall. Owing to the patient's condition and prostration, and also to the extent of the abscess cavity, we were obliged to do the operation under local anaesthesia. A 7 m.m. bronchoscopic tube was passed, after cocainizing the larynx and trachea with a ten per cent. solution. The patient constantly expectorated foul-smelling pus, obscuring the vision and interfering greatly with the progress of the operation. Further complications were caused by the fact that bismuth had been injected into the abscess cavity, making shadows that resembled foreign bodies. After suction and coughing had evacuated this cavity, I was able to see a small ulceration in the inferior branch of the right bronchus. I passed my probe through the ulceration in the mucosa and touched a hard object firmly imbedded. During the operation I continually checked up my findings with the fluoroscope. Finally, I grasped the hard object which was the crown of the tooth, but it slipped from my forceps. Substituting a second pair I succeeded in holding it securely and removed it together with the bronchoscope. The duration of the operation was forty-five minutes, and the patient, though very weak, made a slow but satisfactory recovery. This case further emphasizes the advisability of the prone position for the extraction of teeth. I have known several deaths as a result of the lack of this precaution.

Intra-tracheal anaesthesia is made use of in all operations on the upper air tract; and since adopting this method, I have had no cases of post-operative pneumonia or lung abscess.

I cannot conclude this paper without once more calling attention to our indebtedness to Chevalier Jackson, whose genius and perseverance has placed this work upon a sound basis on this side of the Atlantic.

A CASE OF DIABETES MELLITUS COMPLICATING PULMONARY TUBERCULOSIS

MALE, aged 29. In June, 1921, reported because of weakness, loss of weight (20 lbs.), cough and expectoration, and gave the history of a small haemoptysis, occasional night sweats, and marked polyuria. Both family history and previous history were negative. During the summer of 1917, excessive thirst and polyuria had been noted. There had also been a susceptibility to so-called "colds" which had become more frequent. The cough did not disappear between the attacks. These symptoms had become aggravated a few months prior to his reporting for examination. On physical examination his general condition was found much below par; his chest was well shaped; there was marked retraction at the apices on both sides. Intrapulmonary moisture was noted in the right upper lung and pretty much throughout the left lung, with an area about the size of a silver dollar immediately inferior to the left nipple, highly suspicious of excavation. His daily temperature ranged from 99.2° to 100°, the pulse was 94, and his respirations were hurried. Sputum analysis showed the presence of tubercle bacilli, and these have persisted in later examinations. Urinalysis showed acetone, and 9% of sugar. Blood sugar in August was 0.3% and in September 0.2%. The tuberculin complement fixation test 3 indicating much tuberculous involvement with a high grade of resistance. On four occasions since June 1921, by a modified starving method we have succeeded in bringing about sugar-free urine, but this almost invariably led to exacerbations of the pulmonary lesion. Weight in June, 1921—113½ lbs. Present weight—112¼ lbs. There have been three periods varying from two to four weeks with no elevation of temperature. The temperature on exacerbations has reached over 102 degrees. Prognosis—decidedly unfavorable because of the complications.— F. H. PRATTON.

BICHLORIDE POISONING

From the Bulletin of the Harvey Club,

London, Ont.

TWINS, 2 years of age, were found playing with a bottle contaning 7½ gr. tablets bichloride of mercury (blue). Their hands, faces and clothing were considerably stained wth the blue of the tablets. Vomiting was induced by inserting the finger in the throat after copious draughts of milk had been given. One twentieth of a grain of apomorphine given hypodermically caused immediate vomiting followed rapidly by drowsiness and stupor which continued for an hour. No cyanosis or marked disturbance of pulse or respiration developed. The children rapidly recovered from their stupor; one complained of a sore mouth and lip, which disappeared within twenty-four hours. Nephritis or haematuria did not develop.—G. W. A. AITKIN.

The Menace of the Diagnostic Throat Culture in Diphtheria.—In the interests of clear medical thinking and of our patients, Jesse G. M. Bullowa, Reginald C. Hardman and Harry R. Litchfield, New York (*Journal A. M. A.*, Jan. 27, 1923), emphasize the fallacies that may result from the throat culture diagnosis of diphtheria, and the consequent delay in making the diagnosis from a laboratory report instead of from the clinical picture. The dangers of depending on the diagnostic culture are presented both statistically and by the report of individual cases.—*Jour. Am. Med. Ass.*, Jan. 27, 1923.

Retrospect

HYPERTONIC SOLUTIONS*

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THE effects of administering hypertonic solutions have been studied for many years; indeed as early as 1884 Brasol[1] observed hydraemia in animals after intravenous injections. This was soon verified and enlarged upon by others, notably Kilkowitz[2] and Magnus[3]. Such solutions were first employed in man by Velden[4], who used a ten per cent. solution of sodium chloride and noticed that the coagulation time of the blood was shortened; he accordingly applied it in haemorrhage with good results. This has since been affirmed by others and Schenk[5] and Blumel[6] have shown the same effect with hypertonic solutions of calcium chloride and sodium citrate. It is supposed that some substance promoting coagulation is drawn from the tissues to the blood.

Rapid reduction of intra-ocular tension in glaucoma was accomplished by Sansum[7] by means of the slow intravenous administration of glucose solutions (36 to 50 per cent.). Erlanger and Woodyatt[8] recommended 25 per cent. intravenous glucose injections in shock.

As a therapeutic measure in combatting serious diseases Litchfield[9] strongly advises the use of hypertonic glucose solutions; he points out that besides specific effects in disease due to micro-organisms we have to deal with dehydration, intoxication and nitrogen starvation. In considering these there are many involved problems incident to biochemical processes. All observers are agreed that for such conditions glucose solutions are better than those of salt because they are non-toxic, easily metabolized, and spare nitrogen considerably. Lusk has also demonstrated that to a certain extent, in addition to its food value, glucose has a stimulating effect on cell activity. The addition of gum acacia to glucose solutions seems to take the place of plasma proteins in holding water in the circulation. The beneficial effects are most striking in those patients who are critically ill with influenzal pneumonia[10].

Recently Stejskal[11] has shown that hypertonic solutions cause a lowering of all glandular secretions, even of the endocrine variety and this effect has been applied clinically in many conditions of hypersecretion. He generally used fifty per cent. dextrose solution and mentions particularly reduction in size of the thyroid gland with marked alleviation of symptoms in fourteen out of fifteen cases of advanced hyperthyroidism.

In a very intensive study of the effects of solutions of various concentrations on cerebro-spinal pressure Weed and McKibbon[12] found that hypertonic intravenous solutions of sodium chloride, sodium bicarbonate, sodium sulphate and glucose cause a marked fall, accompanied by an equally marked decrease in the size of the brain. Following this, Cushing and Foley[13], and Sachs and Belcher[14] made use of hypertonic salt solutions to reduce the size of cerebral hernias and to lessen oedema of the brain. Wynn,[15] thinking that this reduction of intra-spinal pressure might be of advantage in cases of neuro-syphilis by favouring the distribution of the arsenical solution throughout the subarachnoid space, made use of hypertonic solutions in several cases before administering the arsphenamine, but obtained no results that he considered of value. Quite recently Barach, Mason, and Jones[16] report with much detail the effects of the administration of hypertonic salt solution upon the blood volume and certain related blood constituents. Their most striking result was that of marked increase in the plasma volume within one or two minutes after an injection of 100 c.c. of fifteen per cent. sodium chloride solution. This increase amounted to from fifteen to thirty per cent. of the total blood volume, representing a pouring out into the blood from the tissues of from 500 to 1,200 c.c. of fluid. The greatest increase occurred about thirty seconds after injection. From this on it gradually diminished, returning to normal within three and one-half hours. In one case in which the plasma volume was abnormally low before injection, the increase lasted four days. The normal isotonic concentration of the blood was in the main, preserved. There was a close parallelism between blood volume and total volume of chloride and also between the blood volume and chloride concentration. From a study of their charts it can be seen easily that the increase in total blood volume is almost entirely due to the increase in plasma volume. They draw attention to a more accurate basis for comparing the blood volume and the blood chlorides by calculating the number of cubic centimeters of water theoretically necessary to bring the increased chloride to an isotonic state. Applying this to their findings, in some instances the figures agree and in others there is a divergence. The divergence, however, is only seen after a second injection, when, owing to the excess of chloride, there is such an increase in blood volume that the other factors concerned in the maintenance of osmotic pressure are disturbed; that is, the percentages of such substances as glucose, sodium bicarbonate and other salts and colloids are lowered, but by the excess of chloride the physiological balance is maintained. In one case they used 100 c.c. of 1,500 per cent. Ringer's solution without relief of headache and with no fall in spinal pressure. The serum was deeply haemolized however, due apparently to the potassium in Ringer's solution, whereas in the cases injected with hypertonic salt solution, there was no haemoglobin in the serum. Alterations in the red blood cells were confined to decrease in number due to dilution, and temporarily lessened fragility. No significant changes took place in the oxygen content of the venous blood and the carbon dioxide content was not disturbed. Clinically, no harmful effects followed the administration of hypertonic salt solutions. Their six brain tumour cases were all symptomatically improved by relief of headache and stupor. The alleviation of the symptoms lasted one day as a rule. One case was relieved of severe symptoms for three days; the return of the disturbing symptoms was very gradual.

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*From a review presented at a meeting of the Osler Reporting Society, December 20th, 1922.

Since the presentation of this paper we find that Dowman[17] administers a saturated solution of magnesium sulphate by mouth in all cases of skull injuries in which immediate operation is not indicated. For some cases with greatly increased intracranial pressure he supplements intravenously, a thirty per cent. sodium chloride solution.

Although the action of the hypertonic solutions is, at the best, of short duration yet their therapeutic value cannot be questioned in a large number of extreme conditions and it is to be hoped that their use will be given wider application.

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EPILEPSY

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Under the term epilepsy are now grouped a range of phenomena motor, sensory, and psychic. Cases are cited as epileptic in which sensory aurae alone appear. Jacksonian motor fits without loss of consciousness are classic; momentary lapses of consciousness without tonic or clonic spasms are well known; cases of localized spasm preceding general convulsive attacks by a year or longer are also cited; and dream states and attacks of furor with amnesia are often not necessarily associated with convulsive attacks called epileptic. So wide is the range of phenomena that some authors now speak of 'the epilepsies.' But 'essential' epilepsy, namely that condition characterized by periodical attacks of loss of consciousness and tonic and clonic spasms remains a well known and recognized syndrome.

The diagnosis of what is apparently a typical essential epilepsy, but more especially of atypical attacks, is sometimes attended with difficulty. Sir Robert Armstrong Jones, for instance, in the *Medical and Surgical Survey*, January, 1922, enumerates twelve distinct morbid conditions which must be differentiated, while Patrick (*Jour. A.M.A.*, September 23rd, 1922) enumerates thirty.

Leaving out of consideration those cases in which a physical condition causing convulsive or epileptiform phenomena can be demonstrated, such as uraemia, brain tumour, syphilis, and arteriosclerosis, as well as those cases in which the symptoms, though epileptiform in character are undoubtedly hysterical, there are cases in which diagnosis remains doubtful until cleared up by close observation extending over a prolonged period. In his article Patrick draws attention to a few common errors and difficulties. He emphasizes the importance of slight or odd attacks in children and young people; a transient dreamy state, a momentary stare, a causeless stop in play, a sudden feeling of fright, a sudden sensation of taste or smell, a sudden lonesome feeling, a sudden drop to the floor. Generally, he says, observation will show them to be epileptic in character and not to be lightly passed over and attributed to 'autointoxication,' constipation, or digestive disorder.

It seems beyond question that the onset of typical epileptic seizures may be preceded by such symptoms. The diagnosis of epilepsy from hysteria is often difficult, more especially when the patient cannot be observed during the attacks and one is obliged to rely on the patient's or the friends' descriptions. The possibility of hysterical attacks occurring in a patient afflicted with genuine epilepsy must be borne in mind. I have seen at least one case in which this occurred. A boy, aged nineteen, subject to major epileptic attacks since early childhood, lay on his bed kicking and struggling and holding his mouth so wide open that he nearly choked himself. Three or four people were holding him down. His pupils reacted promptly to light. As he had his boots on, no time was spent in attempting to examine his plantar reflexes. Pressure over his supraorbital notches and a few words whispered in his ear brought him into a sitting position, and he declared that he was all right. He was not at all dazed or stupid.

Practically, we rely to a very large extent on the nature of the fit in differentiating epilepsy from hysteria. The fall attended with injury, the bitten tongue, the involuntary urination, the change of colour, the loss of consciousness, the tonic and clonic convulsions, the headache and sleep following the attack, are indicative of epilepsy. Should we have the opportunity of observing the patient during the attack we would find rigid pupils and plantar extension or abolished reflexes.

But it is in the atypical and less severe attacks that we have the greatest difficulty in discriminating between epilepsy and hysteria. Lapses of consciousness may be of emotional origin. Patrick describes such a case. A chauffeur, aged twenty-four, had fallen in a fit of unconsciousness seven years previously, during a dispute. He did not know whether he had had a convulsion. In an hour he was all right. During the last few years he had several times experienced a queer feeling as if he might faint or lose consciousness. Two days before, when about to start his car, one or both hands suddenly became numb, he felt dizzy, and then became unconscious, drooping over his wheel. In a few moments consciousness returned, but he felt dazed and confused. He was helped into the house, put to bed, and went to sleep. Next morning he had a headache which persisted. Results of examination were negative. The attack resembled petit mal very strongly. But his family history indicated a neuropathic taint, and it was ascertained that he had lately been subjected to severe emotional stress. Dr. Patrick concluded that the attack was hysterical. After a quiet reassuring talk, the patient continued well and went through the war without nervous incident.

A thorough psychiatric examination is necessary in all doubtful cases. The emotional lability and suggestibility of an hysteric on the one hand, and the egotism, irritability, tendency to suspicion, and want of suggestibility of the epileptic on the other, are aids to diagnosis. Errors in diagnosis may also arise from overlooking the well known fact that epileptic fits may be the first sign of organic brain disease and remain the only sign for some time. Patrick cites a case in which the patient had epileptic fits seven years before signs of brain tumour appeared.

Also, idiopathic epilepsy may assume a local or focal type, as in the case of a man who had clonic spasms of one arm without loss of consciousness for about a year. Attacks of general convulsions with loss of consciousness then occurred at intervals. Results of examination were negative. Under treatment with bromides the attacks ceased. He was seen again fourteen years afterwards. During this time he had been perfectly well.

Curschmann cites a case in which spasms of the muscles supplied by the facial nerve and of the right arm and leg appeared. They occurred frequently but did not last long. During the period of ten weeks of cortical epilepsy, symptoms of multiple sclerosis appeared; spastic gait, nystagmus, and pallor of temporal side of the optic discs. This author reports several cases of cortical spasm in multiple sclerosis, and warns against mistaking this for a sign of cerebral tumour.

Editorial

INDUSTRIAL HEALTH WORK

IN a recent issue of *The Annals of the American Academy of Political and Social Science*, Professor Todd, of Chicago, called attention to the sharply diverse opinions that exist as to the motives and merits of what he terms "industrial welfare work." Whatever may be the arguments from the standpoint of etymology for the use of the word "welfare" in this connection, it is, nevertheless, most unfortunate that an expression long associated with charitable and philanthropic endeavour should be applied to activities undertaken by industrial concerns to advance the health and safety as well as to improve the working and living conditions of their employees.

As a matter of fact, health, or "welfare," work is not a substitute for the efforts to bring about either security or continuity of employment; nor will it take the place of the attempt to introduce proper working conditions, reasonable hours of labour, fair wages or any other fundamental factor in industrial relations. There must be nothing about this work that savours of paternalism or philanthropy; expenditures connected with it must be totally unrelated to wage schedules. Humanitarian or altruistic motives are by no means of primary importance and in the ultimate analysis we may reduce the proposition to the following simple formula: Industrial health, or "welfare," work must be advantageous to both employer and employee if it is to succeed, and economically sound if it is to last.

In other words, its permanence will depend upon its dollars and cents value, and its effectiveness upon the degree of cooperative effort. This does not mean that intangible returns must be translated into financial equivalents but that the sum total or results must justify the operating overhead charges. The ramifications and influences of industrial health, or "welfare," services are far too intricate and subtle to lend themselves readily to precise calculations, and the intangible values are much more important than those which may be expressed in terms of dollars and cents but this does not constitute a justification for disregarding monetary returns.

Let us examine a few of the possibilities. In connection with Safety Services, much time and effort is expended in calculating frequency and severity rates whereas comparisons of the percentages of time lost on account of accidents are rarely considered. The latter figures have a very definite cash value, while the former rates are primarily of statistical importance.

Take First-Aid Departments which undoubtedly prevent infections and other serious complications, not to mention their importance from the standpoint of reducing disabilities, deformities and deaths, yet no one can hazard even an approximate guess as to what all these factors amount to in terms of dollars and cents. On the other hand, to every first-aid dressing there may be assigned a definite financial equivalent for the service rendered and there is, furthermore, a saving in time which lends itself readily to monetary calculations. Just what these values are it is reasonable to investigate and they should be sufficient to establish the economic soundness of the department.

During 1922 the First-Aid Department of a well-known Canadian industrial concern cost $2,700 for its operating overhead charges; the number of first-aid dressings totalled 3,629. Each dressing was worth at least $1.00 and in addition, each case dressed would have taken more than one hour of company time had the Department not been maintained in the plant. The credit for services rendered therefore amounted to $3,629 plus a saving of 3,629 hours of company time at the average wage of forty-three cents per hour; total cash returns from the Department, $5,189.47.

In the case of Industrial Medical Services, there are ample definite credit items to more than justify the maintenance expenditures and the same is true of Insurance Services.

In view of all this, are we not warranted in looking askance at academic discussions of *motives*. Do not the *merits* depend very largely upon the value of the services rendered and should we not eliminate the word "welfare" from descriptions of work of this nature since all such efforts are really concerned with health supervision or adjuncts to it?

B. L. Wyatt

RECENT INVESTIGATIONS ON THE CLINICAL USE OF ARSENIC

TWO interesting papers which were read before the Association of American Physicians at its last meeting in Washington, on some experimental and clinical observations on the therapeutic effects of arsenic are important and worthy of being brought to the notice of the profession in general. The first of these is a paper by Dr. Rudolf and Dr. Bulmer, of Toronto, on "The Fate of Arsenic after intravenous or intrathecal injection, with special reference to its action on the spinal cord." On account of the poor results obtained by clinicians in spinal syphilis from arsenic-containing drugs, however introduced into the body, much controversy has arisen, as to whether arsenic has any special action on the virus of syphilis in the spinal cord. Drs. Rudolf and Bulmer have attempted to solve the problem by giving arsenical medication to animals and then analysing the tissues of the cord to find if the drug reached them at all. On giving a normal rabbit a dose of phenarsenamine proportional to what is given to man, no arsenic could be demonstrated in the cord one hour after intravenous injection. The experiment was repeated several times with the same result; afterwards the dose was repeated increased in amount eight or nine times. All the rabbits were killed an hour after the intravenous injection. The amount of arsenic in the blood was found to rise steadily with each increased dose. The amount in the liver rises slowly at first and later very rapidly, but none was discoverable in the tissues of the cord.

Failing to detect arsenic in the cord after intravenous injection the investigators next tried the intrathecal route. The first problem was "Would the arsenic, if introduced into the lower part of the spinal cord, diffuse upward?" Their experiments indicated that it did not do so to any extent. The writers found that in order to get any arsenic into the cord in this way it was necessary to inject a very large amount, and under considerable pressure. We next tried whether a solution of arsenic in blood serum would favour the introduction of arsenic into the cord, but obtained no definite result. When one considers the small amount of arsenic, if any, that reaches the cord after intravenous administration, even when this is supplemented by intrathecal injection next day, it seems unlikely that any good effects in the treatment of cerebro-spinal syphilis will be induced by the intravenous use of phenarsenamine even when enhanced by the intrathecal injection of arsenic-containing blood serum.

Another interesting paper read by Dr. Kapps, of Chicago, at the same meeting, was on the "Value of Arsenical Treatment of chronic Infectious Endocarditis." The diagnosis of chronic infectious endocarditis is somewhat difficult to make because the patient is often up and about, and may consult the physician only after weeks of malaise, weakness, slight fever, palpitation and loss of weight. It is some time before the true nature of the infection is revealed by the appearance of cardiac murmurs, and symptoms indicative of emboli. A review of the literature brings out the frequency of an earlier and supposedly, a healed rheumatic endocarditis. The mitral valves are most frequently involved, but the aortic may also be the seat of inflammatory trouble. Until the year 1885 Osler had seen only the acute types of septic endocarditis all terminating in death within three months. From 1885 to 1909 he observed ten cases of chronic infectious endocarditis, running a course of from four to thirteen months, all ending fatally. In a paper published in 1909 he drew a clear picture of the condition, emphasising the frequency of a previous rheumatic infection and calling attention to the daily remittent fever, the petechiae, the occurrence of emboli in the brain, particularly in the retina, and to the occasional development of characteristic painful nodular swellings under the skin. Soon after Osler's publication, Billings reported fourteen cases of the chronic type. One patient only recovered, but she had received no specific therapy. During the past twelve years Kapps has treated all of his cases of chronic infectious endocarditis with daily injections of sodium cacodylate, usually given intravenously, and continued over a period varying from seven weeks to four months. In many of his patients, bacteria in blood cultures were not obtainable although the other clinical findings were sufficiently characteristic for making the diagnosis. Eight cases however, were certified by the finding of blood cultures. Two of these died, but six survived. The duration of the disease in the fatal cases was six and thirteen months respectively. The only specific therapy attempted was this prolonged use of sodium cacodylate in doses of one to four grains. Rest in bed was insisted upon during the period of treatment. In all the cases which recovered, the bacteria after treatment were unable to be found in the blood. Kapps own experience with the arsenical treatment inclined him to believe that the drug in ordinary doses is inhibitive rather than bactericidal, and that treatment should therefore be continued over a long period in order to obtain any permanent results.

THE DIAGNOSIS OF SMALL INDEFINITE MASSES IN THE BREAST

AN interesting paper on this subject (*British Medical Journal*, January, 1923) which has its message for every practitioner of medicine was read before the Chelsea Clinical Society by Mr. Fitzwilliams, surgeon to St. Mary's Hospital, London.

The diagnosis of small, undefined masses in the breast presents peculiar difficulties. At the same time a correct diagnosis is of such great importance and a wrong diagnosis carries with it such awful penalties to the patient that the subject is worth serious consideration.

The smaller the mass, the more one is inclined to put it down as inflammatory or benign and defer immediate action. Such a deferment may prove disastrous. Malignant growths must all begin small and this is the most favourable moment for extirpation. The proportion of small malignant growths to large ones that come under the eye of a careful surgeon in Mr. Fitzwilliams' experience is not one in six.

We have all heard of cancer cures, numerous old and impossible ones; more recently we have the modern ones, x-rays, then radium, then selenium and now back again to x-rays with larger and more expensive apparatus. Each new cure holds out just sufficient encourage- to lure on and, I am afraid, to delude the practitioner into thinking that at last a cure is about to be discovered.

For the present unfortunately we are only at that stage in which it is excision and only excision on which we can rely with any certainty, and cure can be expected only when the case presents at such an early stage as will permit of its radical removal.

In dealing with tumours of the breast it is not recognized sufficiently clearly that the vast majority are malignant. It is computed that eighty and eighty-five per cent. of breast tumours are malignant, and at most fifteen to twenty per cent. innocent, or innocent in their early stages. This means that a lump in the breast, however small, is much more likely to be malignant than to be innocent.

We must remember, also, that there are a large number of cases which, although innocent to begin with, later take on malignant characters. The symptoms of malignancy as stated in textbooks are all late symptoms; adherence to the skin or to adjoining structures, enlargement of glands in the axilla, retraction of the nipple, and shrinkage of the organ are all late signs. The presence or absence of a tumour felt with the flat of the hand so insisted upon in the past is quite fallacious. Our teaching has been grievously at fault, as it has not laid sufficient stress on the necessity for an immediate and thorough investigation of every tumour. No surgeon has any right to tell a patient that a lump which has no definite characteristics is nothing. Malignant disease must start in a small area, yet how few cases are operated upon at this stage. Yet by the time they can be diagnosed with certainty they can no longer be considered early cases. They have spread to such an extent that they show positive symptoms of malignant disease, and the prognosis has changed from being favourable and has become grave. What ought to be done in early cases? The surgeon should confess at once that by the ordinary methods of inspection, palpation, etc., it is impossible to make an absolute diagnosis. All that can be said is that as yet there are none of the characteristic features of malignancy; the surgeon however must not sit down calmly and deliberately and wait for these features to develop; something more must be done. The sporting chances are against any delay. It should be pointed out to every patient over thirty that the microscope is the only method of arriving at an absolute diagnosis, and the great advantage of making an absolute diagnosis at the earliest possible date should be emphasized. Mr. Fitzwilliams warns us also of the danger of making light of a tumour merely on account of the age of the patient. He states that he has known two cases of cancer of the breast, which occurred under twelve years of age, and many which occurred in the 'teens. Rodman collected the history of 5,000 cases of which nearly ten per cent. occurred in patients under thirty years of age. The surgeon should place the responsibility for any delay solely upon the patient herself, and emphasize the fact that delay means spread of the disease, and to wait for the development of characteristic signs may involve most serious consequences. Certain information can only be obtained by operative means.

Exploratory operations for removal of the lump alone should be undertaken only when the preponderating evidence is in favour of benignity. Where strong suspicion of malignancy exists the whole breast should be sacrificed. In border line cases the mass alone may be removed but always with the cautery and not with cold steel, because of the very real danger of liberating cancer cells or whatever may be the active metastatic agent and setting up through the opened vessels a blood metastasis to distant and inaccessible parts.

The recent education of the public upon the cancer problem has resulted in an increasing number of women presenting themselves for examination of the breast, and has thus added to the diagnostic responsibilities of the physician many fold. The profession must be prepared to cope with this added responsibility by developing a more detailed knowledge of the early changes in the breast and more acumen in their differentiation.

Editorial Comment

RUBBING ALCOHOL

At several of the recent Annual Meetings of the Canadian Medical Association, and also frequently at the meetings of local societies, attention has been called to the poisonous properties of Columbian spirits and methylated alcohol, and to the danger of toxic symptoms developing from their external use. Owing to the high price of pure ethyl alcohol due to the excise, its use externally both in hospitals and in the majority of private houses has been practically prohibited. It is, therefore, with pleasure that we call the attention of all our readers to the denatured alcohol now offered to the public under the name of "Rubbing Alcohol" by the Dominion Department of Health. The denaturant employed is di-ethylphthalate which appears to be very suitable for the purpose owing to its stability and freedom from colour and odour while at the same time its taste renders the spirit quite unfit for beverage purposes. Among its other advantages are its ready miscibility, suitable volatility and high boiling point; it leaves no sediment, and is not very poisonous, but possesses the slight antiseptic properties of the phthallic group. It is also very definite in its chemical reactions so that its presence can be readily recognized by chemical tests, which are easy to carry out. Two and one-half gallons of this diethylphthalate, along with five grains of brucine to increase the bitter taste are added to one hundred gallons of ethyl alcohol to form this 'rubbing alcohol' which appears eminently suitable for all forms of external applications, and may be obtained at a moderate cost.

ON HICCUP

Hiccup is for the most part a temporary and very disturbing affection to the sufferer, but may become very persistent, and continue for hours and days, and very seriously interfere with the comfort and health of the patient. Recently we noticed the account of an epidemic which had hiccup as its important symptom. In a recent number of the *British Medical Journal* there is a short editorial on the subject of hiccup. Mentioning that a correspondent had sent the following extract out of a book published a couple of years ago, entitled "The Humours of a Parish, and Other Quaintnesses" written by the Rev. W. B. Money, in which the following directions are given for curing a persistent hiccup. The feat is not quite easy to perform, but it seems unlikely that it can have any injurious effect. The directions are as follows: "Take a tumbler and fill it about half full of water; put your lips to the opposite side of the rim to what you ordinarily would in drinking, tilt the glass away from you instead of towards you, and so sip the water. That is all, but you will want nothing more. You will be a healed, quiet, restful man" Mr. Money declares that he has never known it to fail, and relates some interesting experiences. Mr. Money's prescription seems to be nothing but an ingenious device for inducing the patient to keep his lungs for a time in an average condition of distension though he can still breathe. Ever since the classical experiments of Hering and Breuer we have known that on distension of the lungs the afferent nerve endings of the vagus are excited, and the corresponding impulses on reaching the respiratory centre inhibit inspiration. It is also possible that these impulses may inhibit the violent respiratory spasms of hiccup, and may secure temporary relief which may persist for a very considerable time and in many cases be permanent.

MEDICAL HISTORY

A Late addition to the curriculum is the history of medicine: and the reasons advanced for adding an additional burden to the already overloaded medical course and thereby helping to increase the total number of years of study, must be almost self-evident. The physician if he is to retain his status in society must be more and more a cultured gentleman. He must be more than "a dispenser of pills and powders." He must be a leader in the community, with high ideals. His aim should be "how much can I contribute rather than how much can I get out of this community." The study of the development and evolution of medicine can play a prominent part in stimulating such an altruistic attitude of mind.

It is customary to dwell upon the lives of the fathers of medicine, Æsculapius, Hippocrates, Galen, etc., but that is not absolutely essential. There is plenty of material at our very doors. One could peruse with advantage the story of the splendid achievements of the pioneers in our own province—the many Dr. McClures that have come and gone, "untolled, unknelled and unsung." If one could visualize the country doctor on the dark and stormy nights with his constant companions—the saddle bags and the faithful horse, a picture that has inspired our Canadian poet Drummond in "The Habitant"—one could appreciate the unselfish motive that prompts the doctor to risk life and limb, simply that he may be of help and comfort to some poor unfortunate patient. Nor can one be unmindful of the picture of such types as Grenfell of the Labradors or Trudeau of Saranac Lake. Any undergraduate is thrilled by a narrative of this type and of necessity will go into practise "a bigger and better citizen."

It seems a misfortune that few such records are available for students. The late Dr. Canniff, of Belleville, is the only one that has taken the initiative in this matter. "The Medical Profession in Upper Canada, 1783-1850" is a treasure house. Sir William Schooleny of the Hudson's Bay Company has done valuable work for our future historians. While searching the archives at Ottawa for the material of the history of his Company, he has saved all references to medical items, doctors, epidemics, drugs, etc. It is to be hoped that all records, photos, instruments, etc., will be preserved and made available for our future historians. J. W. C.

Bismuth Salts in the Treatment of Syphilis.—Escher (*Ann. de l'Institut Pasteur*, December, 1922, p. 839) has used trepol and neo-trepol in a large number of cases of syphilis in soldiers with very satisfactory results. In the present communication he analyses the results of treatment with trepol(tartaro-bismuthate of sodium and potassium) in 60 cases. At first he gave courses of ten to twelve intra-muscular injections of 0.3 gram. But such doses frequently caused stomatitis and gingivitis, and occasionally albuminuria, and he therefore reduced the dose in later courses to 0.2 gram, given every fourth or fifth day. In 10 cases in the primary stage with a positive Wassermann reaction in the blood the parasite disappeared from the chancre in twenty-four to fifty-six hours after the first injection, and living spirochaetes were never found after forty-eight hours. The swelling of the inguinal glands subsided more rapidly than after any form of arsenical treatment, and parasites were not found in the serum aspirated from these glands six to eight days after the first injection. The chancres healed rapidly, and secondary rashes never appeared during the treatment. The Wassermann reaction became negative after the first course in 6 cases, in 2 at the end of the second, and in 2 between the second and third courses. Forty cases in the secondary period were treated. Mucous plaques began to heal on the fifth or sixth day, and parasites disappeared from them in thirty-six hours. Roseolar rashes disappeared in every case after the third injection. Pigmentation of the scars was much less frequent than after arsenical treatment. In 30 of these cases the Wassermann reaction became negative after one, two or three courses of trepol. Pain at the site of injection was rarely met with after "painless trepol." Stomatitis and gingivitis could be controlled by thorough attention to the teeth and mouth-washes when doses of 0.2 gram were given. Albuminuria, which occurred in 9 cases, cleared up on cessation of the drug and a vegetarian diet. The presence of clusters of renal epithelial cells in the urinary deposit was a warning of the imminence of albuminuria.—*British Medical Journal*, January 27, 1923.

Otitic Abscess of the Cerebellum—The case reported by C. F. Yerger, Chicago, is of special interest, (1) because of the difficulties it shows in diagnosis (some cases will give few, if any, localizing signs); (2) because a cerebellar abscess was found on surgical exploration of the posterior cranial fossa, and (3) because the necropsy report was added to the clinical record, thereby making the case record complete.—*Jour. Am. Med. Ass.*, Jan. 27, 1923.

Men and Books

MR. E. Z. MASSICOTTE ON THE PHYSICIANS AND SURGEONS OF THE XVIIth AND XVIIIth CENTURIES IN THE DISTRICT OF MONTREAL[1]

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It is a remarkable fact that although Canada has never, in the three hundred years of her existence, lacked men of education and parts who have practised the healing art within her borders, and who have left their impress on the medical thought of their time and community, no attempt has yet been made to systematize or compile a history of Canadian Medicine. This circumstance is the more surprising in view of the progress that has been made in this regard by our neighbours to the South, whose cultural history so little antedates our own, and whose contributions to early medical science and journalism, and standards of higher professional education can scarcely be considered to have been in advance of those of the Canadian profession of the same period, yet whose early medical history bulks large in the current text-books on the history of Medicine, and forms the subject of several important volumes.[2] The medical tradition of Canada is as picturesque and important in its way as is the rest of her history, and the hiatus that exists here must be considered to be due rather to the relatively late development of what may be termed the historic sense among us, than to any lack of intrinsic interest.

Authentic data for historical research along these lines are not lacking, for both Dominion and Provincial Archives have been faithfully preserved, and in recent years much earnest digging and careful indexing have been done for the benefit of future historians. Several valuable monographs of a local character have also been published, of which Canniff's *Physicians of Upper Canada* and Dr. H. S. Birkett's admirable study entitled *A Brief Account of the History of Medicine in the Province of Quebec*[3] are among the most important. Of fundamental value, and of direct interest to the profession in the latter connection, is the recent work of Mr. E. Z. Massicotte, Archivist-in-Chief of the District of Montreal, who has brought to bear upon the social history of this part of the country, during the early period from the foundation of Montreal to the British conquest of French Canada, the garnerings of thirty years of quiet industry among the original notarial documents under his charge. Passing from a study of those following the various trades and professions, he has now arrived at that of Medicine, and has published, in the *Bulletins des Récherches Historiques*, and *l'Union Médicale*, a series of articles upon the Physicians and Surgeons of this district (a) from 1642 to 1700*, and (b) from 1701 to 1760.* These consist of notes culled from various property-sales and transfers, marriage contracts, wills, etc., giving the names, origin, location, civic status or other data about the various persons practising medicine in this locality, as these have become available. Such information is especially important because the period covered is that *before* the Medical Act of 1788, for the granting of licenses, was passed, and therefore before any official register existed. Mr. Massicotte has collected no less than forty-two names of physicians and surgeons practising in this district between 1642 and 1700, and thirty-five during the succeeding sixty years, making seventy-seven in these 118 years, which is a goodly percentage. Among these, Silvain (altered from Sullivan) was Irish, Spagniolino, Italian, and Feltz, Austrian. Ten of the seventy-seven were barbers as well as surgeons, following the custom of the time, which was that of seventeenth century France, and these frequently entered into contracts to bleed as well as shave their patients, in return for a fixed sum per annum. The others were simply "surgeons" or salaried *médecins du roi*. Only one of these early French practitioners of the French regime, Mr. Massicotte tells us, was a "black sheep." This was an unfortunate man named Jean Lacoste, who, in 1744 was condemned to death, under the severe law of the time, for forging a five-livres note (amounting to about five shillings)! This sentence was commuted, on appeal to the Superior Council, to an appalling punishment; he was conducted through the town of Ville-Marie stripped naked, lashed at four different street corners, and branded on the face, and was then immediately sent to Quebec to be despatched by the first ship sailing for France, to work as a galley-slave on the King's ships for life.

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*locus cit.

The following further information abstracted from these articles is of interest:

> "The first surgeon whose name comes down to us in this district is *Louis Goudreau*, who was here in 1648.... *Jean Poupée*, in the same year assisted at the birth of the first children born here of European parentage...... *Etienne Bouchard*, the most prominent of his contemporaries, arrived in 1653, under an engagement to remain five years in charge of the medical needs of the colony; he stayed a quarter of a century. In 1658 he made a contract with the chief inhabitants of Ville Marie for 100 sous per annum, in return for which he would '*panser et médicamenter chaque contractant et sa famille*', 'for all sorts of diseases, both natural and accidental, except plague, smallpox, leprosy, *mal caduc*, (epilepsy) or for removal of stone.' Nicholas Colson engaged himself to Bouchard on November 15th, 1660, as assistant at 150 livres a year, plus food and lodging; and is later found in the employ of *Jean Madry*, a surgeon of Quebec, who was given by His Majesty's Chief Barber and Surgeon a Commission dated April 2, 1658, authorizing him to himself exercise the office of barber-surgeon in New France, and also 'to establish for the public good, the business and art of barber-surgeon in all places, towns, bourgs and bourgads that are under the obedience of the King.'........*Réne Sauvageau*, surgeon of the company of M. Dugué de Boisbriant, entered into partnership with *Jean Rouxcel de Rousselières*, and both accompanied LaSalle on his exploratory expedition to the Great Lakes. In 1668 Sauvageau leased from one Brunet a house for twenty-five livres, with the agreement that both partners should 'serve with their art of surgery the lessor and his family for all sorts of diseases and accidents, and supply them with medicines, and also to shave the said lessor.' ....*Jean Martinet* conducted a system of apprenticeship: in 1674 he engaged his brother-in-law, *Paul Prudhomme*, a surgeon, to work under him; in 1681 *Francois Lady* (for three years); and in 1691, Raphael Lecourt (for five years). He and *Antoine Forestier* were the accredited physicians of the Hotel Dieu by an Act dated 13th July 1681, by which they undertook 'to serve the said Hospital—to visit it daily in alternate quarters of three months each, at 7:00 a.m., and through the day, also, if necessary—the one to relieve the other at request—they to receive seventy-five livres—the remedies to be supplied by the hospital.'...... *Michel de Sirsé de Saint Michel* bought of Jean Planchard, forty arpents of ground for 1,125 livres, and further undertook 'for three years to perform the services of surgery, for shaving and bleeding only of the said buyer, his wife and children, at their house at Pointe-aux-Trembles.' In another place the same surgeon is designated '*Chirurgien et valet de chambre de Mgr. le Gouverneur Perrot.*' "

Many of these early surgeons shared in the heroic defense of the colony against the Iroquois, and several forfeited their lives. Such were *Louis Chartier* (1653-1660), *Antoine Chandillon* and *Jean Jallot*, who died in securing the safety of the lower end of the island in 1690.

Several ancient documents of a purely medical nature are transcribed in full with their quaint orthography intact. Of three "Physicians' Accounts"[4] so published, the most interesting is perhaps that rendered by the Sieur Puibarau de Maisonneuve, *à Mr. Chartier et à Mademoiselle son Népouse et à lrs. Domestiques*, for the years 1734-35. It contains some forty items and totals 159 livres, 15 sous. "Bleeding" recurs nine times on the list, and was done for the nominal charge of 15 sous per time; giving an enema (lavement), cost one livre (about 20 cents); an ounce of "*eau divinne*" 2 livres.

Another very interesting document quoted in full is the will[5] of *Dr. Michel Sarrazin*, Surgeon-Major of Quebec, which was drawn up in Montreal on August 3rd, 1692, at the Hotel Dieu on St. Paul Street. Among other legacies, he bequeathed "all my surgical books" to the "Sieurs La Source, St. Armands, and La Sonde," three physicians of the hospital staff, who had no doubt attended him. This Dr. Sarrazin was the most famous of the medical men of New France, and was distinguished both as a great physician and a skillful surgeon, and also as an anatomist, naturalist and botanist. From his record and that of some others like him, we learn that the new spirit of scientific research was at work here, as well as in the Old World, in the then untilled fields of human anatomy and animal and plant life. Charlevoix wrote of this celebrated savant,—"*M. Sarrazin, correspondant de l'Académie, Médecin du Roy dans ce pays, habile dans la médecine, dans l'anatomie, la chirurgie et la botanique; qui a l'esprit orné, et qui ne se distingue pas moins dans le Conseil Supérieur dont il est membre que par son habileté dans tout ce qui est de sa profession.*" His biography has been made the subject of an exhaustive study by Mgr. Laflamme,[6] which was presented before the Royal Society of Canada in 1887. The main facts are summarized by Mr. Massicotte, (*l.c.*). Born in 1659 at Nuits, in Bourgogne, he studied medicine in Paris, and came to Canada in 1685. Returning to France in 1694 he took a medical degree at the University of Rheims,† and, in 1697, came back to Quebec, at the urgent request of the inhabitants, with the title *medecin du roi*, at a salary of 600 livres. In 1699 he was created Physician-in-Chief of all Canada, and was elected also a corresponding member of the newly established *Académie des Sciences* of Paris, with the special duty of making a study of the plants and animals indigenous to Canada. His subsequent communications to the Academy upon the beaver, muskrat, wolverine, porcupine, etc., are published at length in its Memoirs and won for him a pension of five hundred and fifty livres. As a botanist he is known as the discoverer of the pitcher-plant, which was called after him, *Saracennia purpurea*, as the *Gaultheria procumbens* (wintergreen), was named after Dr. Gaulthier, another distinguished Quebec physician and botanist of the period, who was also, with Sarrazin, a Corresponding Member of the French Academy.* Dr. Sarrazin died in 1735, of a malignant ship-fever caught in the wards of the Hotel Dieu, of Quebec, of which he was attending physician. One of his daughters, Charlotte, married Joseph-E.-T.-Gaulthier, Seigneur de Varennes.

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†or Rens.

M. Massicotte closes his articles with the hope that these notes may some day be of use to the future historian of medicine in New France. We understand that he is now at work on a more comprehensive monograph which will present a complete statement of all the information he has collected on this subject to date. It will appear in the next Annual Report of these Archives. Such a contribution, emanating as it does, from one who is not himself a member of the medical profession, is a labour of love which commands the grateful recognition of us all.

1. *Les Chirurgiens de Montréal du XVIIe Siècle*, Par E. Z. Massicotte, *Bull. des Rech. Hist.*, 1914, XX, 252-258; Also *L'Union Médicale*, 1917, XLVI, 310-315. Additional Notes, *Bull. des Réch. Hist.*, 1921, XXVII, 41-47. *Les Médecins, Chirurgiens et Apothecaires de Montréal de 1701 a 1760. Idem. Bull. des Rech. Hist.*, 1921, XXVII, 75-80. Additional Notes on same *Ibid* pp. 325-327. *Chirurgiens, Médecins, etc. sous le Regime Francais à Montréal (Nouvelles Notes) Idem. Bull. des Rech. Hist.*, 1922, XXVIII, pp. 247-251.

2. See "History of Medicine in the United States," by Francis Packard, Lippincott, Philadelphia, 1901; also "A Narrative of Medicine in America," by James Gregory Mumford, M.D., Lippincott, Philadelphia, 1903.

3. Presidential Address delivered before the 30th Annual Congress of the American Laryngological Association, held in Montreal, Canada, May, 1908. *Medical Record*, July 25th, 1908.

4. *Camptes des Chirurgiens Montrealais du XVIIIe, Siecle.* E. Z. Massicotte, *Union Méd.*, 1919, XLVIII, 507. Also, *Bull. d. Réch. Hist.*, October, 1919.

5. *Un Testament du docteur Sarrazin. Idem. Bull. d. Réch. Hist.*, January, 1919.

6. *Michel Sarrazin: Materiaux pour servir à la service de l'Historique de la Science en Canada.*, *par l'Abbé Laflamme. Proc. Royal Soc. of Canada*, 1888, V, Sect. 4, pp. 1-23.

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*See Dr. Birkett's Article.

Correlation of Efficiency Tests.—Jesse Feiring Williams, New York, reports tests made on 108 students of the University of Nevada. There was, in this group, virtually no correlation between the Sargent physical test and the Schneider cardiac test for women of the age range 17 to 23 years. The rather high correlation of 0.57 previously reported Williams believes was doubtless a change result and was due to the wide age range of the group tested, or to a possible difference between men and women. The Sargent and Schneider tests do not measure the same thing. Vigor, stamina, "pep" that Dr. Sargent refers to are not the same qualities as are measured in Schneider's test. Whether Sargent's test is a good measure of physical vigor has not been determined; likewise, the reliability of Schneider's test is not indicated by this study.—*Jour. Am. Med. Ass.*, Jan. 6, 1923.

New Regulations on Marketing of Medicinal Whisky.—Bottled-in-bond whisky will from now on gradually replace bulk whisky for medicinal use, under a decision recently issued by the Commissioner of Internal Revenue. This decision is the outcome of the resolution aodpted by the House of Delegates in St. Louis, last May, recommending that provision be made for the marketing of whisky in bottled-in-bond containers, so that physicians who prescribe whisky may have some assurance that their patients will receive the genuine article. Throughout the conferences that have been carried on, the officers of the Association have met with cordial cooperation on the part of the government officials. All agreed that, so far as it is necessary to use whisky for medicinal purposes, the supply should be of known purity. In the absence of any legal standard of purity except that provided by the Bottled-in-Bond Act, it was generally conceded that any provision whereby bottled-in-bond whisky would be made available for medicinal uses to the patient in original sealed containers would go a long way toward solving the problem. One difficulty has been to find some way in which this could be done; that difficulty has been largely overcome in the decision just issued.—*Jour. A. M. A.*, Jan. 6, 1923.

Correspondence

DILUTE IODINE LOTION IN ACNE

To the Editor:

REMEMBERING the high dilution in which iodine has been found efficient as an antiseptic, it occurred to me that a dilute solution which would not stain the skin, and which could be applied daily without irritation, might be serviceable in the various pustular eruptions such as acne, eczema oris, etc., which are so disfiguring to the faces of those that suffer from them. The results in the limited number of cases in which I have had an opportunity of trying the treatment have been so gratifying that I feel justified in reporting the matter..

I use *Tr. Iodi Mitis* B.P. one drachm to 8 ounces of water as a lotion at night, or in some cases night and morning. Fresh solution should be made up every week, as the iodine volatilizes fairly rapidly. The treatment must be continued indefinitely, but patients are so rewarded by the marked improvement in their appearance, that they are glad to continue.

Within a few days after commencing the treatment, formation of pustules is retarded, the induration and redness surrounding the more disfiguring lesions begins to lessen, and many of the smaller lesions disappear altogether. Few fresh ones appear, and those which do are less extensive and more transient than formerly. The inflammatory reaction surrounding a few of the more acute lesions may be slightly aggravated by the first few applications, in which case the patient is advised to avoid these areas for a few days until the acute process subsides.

One patient, a case of eczema oris, had been treated at various times with the following; eucalyptol ointment, Fordyce's paste, sulphur ointment, autogenous vaccine of staphlococcus albus, 95% alcohol as a lotion, ether as a lotion, and ammoniated mercury, (grs. x to the ounce benzoated lard). All these methods except two either failed completely or aggravated the condition. Ammoniated mercury ointment proved of benefit in controlling the eruption to some extent, but its effect was neither as great nor as constant as the iodine solution. Neither was it as convenient or pleasant an application. Ethyl alcohol 95% was of as much, if not more, benefit than the mercury. This patient is still using the iodine lotion and seldom does a papule appear, and those which do are faint and inconspicuous. Neglect of treatment, however, when away from home, and use of old solution under strength have on some occasions resulted in recurrences of greater or less severity.

One patient, an extreme case of acne, was so much improved after a week's treatment, that one of his associates remarked to me, "He used to have acne very bad."

Beachville, Ont. E. N. BALLANTYNE, M.D.

SERUM TREATMENT OF GLANDERS

To the Editor: During the early part of 1922 there was a serious outbreak of glanders among the horses at Treesbank, Manitoba, and a young farmer who had several of his animals affected, contracted the disease. He was brought to Winnipeg, and Dr. A. Gibson had him under his care for several months at the Galloway-Gibson clinic, where he was vigourously treated without any very appreciable effect. In the early part of December, while discussing the case with Dr. Torrance, Dr. Watson, Dr. Heath and Dr. Gallivan, at the Biological Laboratory, Health of Animals Branch, at Ottawa, they told me they had a horse that they were endeavouring to immunize by the repeated injection of mallein and that if we had the courage to try its serum on a human being they were willing to supply it practically *ad lib.* I brought home a considerable quantity and Dr. Gibson readily assented to its being tried out. To be brief, the results were simply amazing. This young man had a suppurating sinus running from below the knee to the ankle, and six shorter ones radiating from this region and riddling the foot and lower part of the leg, besides a large ulcer, one and a half inches in diameter about the internal malleolus. Indeed, so grave was his condition that amputation above the knee was seriously considered.

After four or five injections of the serum the sores had ceased to suppurate and in less than three weeks were completely healed and the man is now about his work as usual.

In the meantime the young doctor who was attending the case had accidentally infected himself and came to Winnipeg with an angry sore one inch in length and three-quarters of an inch in width on the upper part of the dorsal surface of the right forefinger. The edges were undermined and on the slightest movement of the finger pus exuded everywhere from the floor. It was steadily progressing in spite of the application of iodine and other antiseptics and the *Bacillus Mallei* was found in pure condition in the discharge.

After three injections of the serum it assumed the appearance of a clean sore in which the bacillus could not be found either by culture or smear and which went on and healed in the most kindly fashion until, in less than two weeks, the skin was again quite intact.

Dr. Gibson and Dr. Jackson will make a full report on these cases at an early date but in view of the possibility that there may be other sufferers from this infection I thought it right to ask you to publish this preliminary note.

There is perhaps no chronic infection that has such a gruesome and distressing clinical course as glanders and any new and better method of treatment will prove a boon. Any physician having the opportunity and wishing to try this serum can count, I am sure, on the eager co-operation of Dr. Torrance's Department.—Gordon Bell, M.D., C.M., *Professor of Bacteriology and Hygiene, University of Manitoba.*

Winnipeg, January 31st, 1923.

The Editor,

Canadian Medical Journal, Montreal.

Dear Sir:

Are the members of the Canadian Medical Association aware of the fact that it is the intention of the Government of Canada to charge duty on books on medicine and surgery, and on reprints of articles written by Canadian physicians and surgeons for free distribution amongst their colleagues in Canada. Article 172 of the Customs Tariff, "provides for the free entry......of books on mechanic arts and similar industrial books, but it does not provide for the entry of books on medicine and surgery." "Non-advertising printed books on medicine or surgery. .are subject to duty under tariff item 171 at the rate of ten per cent. ad valorem, general tariff, plus the sales tax, when imported by individuals, unless they are included and used as text books in the curriculum of a university, college or school in Canada."

Under past governments reprints of articles written by medical men for free distribution amongst their colleagues were admitted into this country freely and without custom duty. It is noted that this, apparently, is not to be the practice under the present regime. This is regrettable, because a customs duty imposed on educational books or reprints can act only to the detriment of the Canadian people and is very definitely opposed to the spirit of the law. Past governments have lived up to the *spirit* of the law, whereas it is feared that the present government can only be expected to uphold the *letter* of the law. The reason for this change in practice by the Department of Customs is not a question of politics, but the Canadian Government is harassed by an ever-increasing debt which forces them to bleed the Canadian people in an endeavour to make ends meet. The burden of this debt under which Canada labours is equally due to Conservative and Liberal Governments alike. While medical men will sympathize with all legitimate efforts made to provide revenue to meet our country's obligations the medical profession of Canada should unite to see that our Governments are not permitted to increase their revenues at the expense of the advancement of science and especially that science which stands for the healing of the nation.

Yours faithfully,

December 21st, 1922. A. MacKenzie Forbes

N.B. The words in italics in this letter are quotations from letters written by the Minister of Customs.

Abstracts from Current Literature

MEDICINE

The Wassermann Reaction in The Johns Hopkins Hospital.

Keidel, A., and Moore, J. E., *Johns Hopkins Hosp. Bull.*, January, 1923, Vol. 34, pp. 76.

The authors report the results of their work in the Wassermann laboratory of the Syphilis Department of the Johns Hopkins Hospital since January, 1918. During this time the sera of about 45,000 patients from all services of the hospital have been examined. An account of the method of performing the test is given.

Keidel and Moore feel that the Wassermann test should be done on all patients. In order to show the advantage of this procedure in preventive medicine, they consider that it is of interest to examine the difference between the hypothetical number of cases of syphilis, which might have been detected in the various departments of the dispensary, had the Wassermann been done as a routine, and the number of cases actually discovered.

Of 4,736 public ward patients, white and coloured, in the medical house service (where routine tests were done) 14.2 per cent. had positive Wassermanns (7.6 per cent. of whites, 22.9 per cent. of negroes). The social level of these patients corresponds closely with that of dispensary patients, though in the dispensary there are relatively more negroes This difference in the racial distribution would tend to make the routine figures for dispensary patients even higher. Assuming, however, that, had the Wassermann been employed, as a routine in all departments of the dispensary, then 14.2 per cent. of the tests would have been positive. The authors give a table showing the theoretical numbers for positive reactions in the different departments for dispensary patients to compare with the actual numbers found there. They conclude from these comparisons that because the test is not done as a routine no department of the dispensary is more than thirty-five per cent. efficient in detecting syphilis. In the course of seventeen months, then, 4,246 potential syphilitics were not discovered.

The Wassermann reaction is the most reliable test for syphilis which we have at present, although it is not infallible and the authors consider that sufficient laboratory space and equipment should be provided to perform it on all in-patients and out-patients of a genera' hospital. All the cases of syphilis now undetected could be treated, and thus the spread of infection could be lessened. The birth of syphilitic babies could be prevented and the disease would not carry off the very large numbers that it does at present owing to its involvement of the cardiovascular and nervous systems.

Archibald Malloch

On Relapsing Pyrexia in Lymphadenoma, With an Account of a Case.

Hall, A. J., and Douglas, J. S. C., *Quart. Jour. of Med.*, October, 1922, Vol. 16.

Pel, in 1885, and Ebstein, in 1887, described cases of lymphadenoma showing a peculiar type of relapsing or periodic pyrexia. A. S. MacNalty collected thirty-two such cases in 1911 and to-day records of perhaps fifty could be found, but very few of these would compare in duration of the relapsing fever with that of Ebstein's cases. So distinct may be this type of temperature, which may last for months, that a diagnosis may be made from it alone.

The authors compare many known cases by charting out the temperature curves in an identical way. They conclude that the relapsing type of fever differs in certain respects from that seen in any other disease. It resembles that seen in malaria, relapsing fever, rat-bite fever and some others in (1) regular periodicity, (2) gradual ascent by steppage and sometimes similar gradual descent, and (3) very low temperatures with apparently complete recovery in the apyrexial periods. In cases of lymphadenoma or Hodgkin's disease, the span (the interval of time between the date of the middle of a wave of pyrexia and that of the middle of the next wave) is usually from fifteen to twenty-five days, but may extend to thirty-six days. In the other diseases the span is not so long. In lymphadenoma it is usually constant for each individual case.

It cannot yet be said that we know why such a type of temperature is seen in some and not in other cases of lymphadenoma, nor that we know the cause of the disease. Archibald Malloch

PAEDIATRICS

The Influence of Atropin on the Infant's Stomach. Salomon, Adolf. *Monat. Schrift. für Kinderheil Kunde*, October, 1922.

In order first to determine the effect of atropin on the normal stomach, Salomon selected six healthy infants from three weeks to eight months of age. By means of the stomach tube and the x-ray he found that the stomach is quite empty five hours after feeding, while one hour after feeding he was able to withdraw from twenty to 100 c.c. fluid from the stomach. On the following day each infant received one or two drops of a 1-1000 atropin solution in his first bottle. Five hours later Salomon was able to withdraw from 5 to 15 c.c. stomach contents. In only one case was he unable to get anything. The infants were later given two to three drops of the atropin solution one-quarter hour before their next feeding; one hour after the feeding a larger quantity of chyme was obtainable than on a previous day when no atropin had been given. The routine of the first day was then repeated in order to control the results. Atropin was in this way found to delay the emptying time of the stomach, as shown by the fact that more fluid could be withdrawn one hour after feeding and that there was always some residue in the stomach five hours after feeding when under normal conditions the stomach should have been empty. At the same time there was no diminution in the secretion of hydrochloric acid, the hydrogen ion concentration being unchanged in spite of the greater residue.

The explanation is simple: Atropin causes a relaxation of the muscle tone of the stomach. Peristalic waves, as shown on the fluoroscope, become slower and weaker and there is no apparent relaxation of the pyloric sphincter. Atropin appears to have no effect on the pylorus. The good effect of atropin in pylorospasm must, therefore, be due to a reduction in the gastric hypertonia which must be present in a number of these cases. Indeed, continued vomiting in a case of hypertrophic pyloric stenosis which had been operated upon, was only relieved by the administration of atropin.

Habitual vomiting is a neuropathic condition which may simulate pylorospasm, but lacks the diagnostic signs. Atropin in sufficiently large doses will relieve this condition, but often surprisingly large doses are required; not only is the vomiting relieved but the infants become less restless and more happy as a result of treatment.

Conclusions. Atropin causes a relaxation of the normal tone of a healthy infant's stomach. It has no effect on the pylorus. Even after several large doses, atropin causes no diminution in the secretion of hydrochloric acid. The favourable results obtained in pylorospasm are due merely to the action on the stomach muscle, and not on the pylorus. For the same reason, atropin is very often beneficial in controlling habitual vomiting. L. M. LINDSAY

A Selective Medium for the Diphtheria Baccillus. Greenspon, E. A. *Johns Hopkins Hospital Bulletin*, January, 1923, vol. 34, p. 30.

The author undertook to try and find a medium better even than Loeffler's blood serum, which, if possible, would be more selective. In doing this he attempted to discover some substance which would accelerate the growth of the bacillus and at the same time would inhibit the development of other organisms generally found in throat swabs.

The steps by which he finally reached the formula of the new medium are given. The final outcome of his work is as follows, "To 75 c.c. of clear pig, sheep, or human serum, is added 1 c.c. of a fifty per cent. sodium citrate solution and sufficient dextrose-veal-infusion-broth to bring the volume to 100 c.c. With a three per cent. citrate acid solution the reaction is then adjusted to p.h. 6.4 by the cololimetric method, as described in recent editions of books on bacteriological technique. Di-brom-thymol-blue is an indicator which covers the range required, gives fairly good colours, and is not subject to the qualitative error of brom-cresol-purple. If the medium is made more acid than ph. 6.4, it does not coagulate firmly and the surface may break when it is streaked with a platinum loop or throat swab."

Greenspon's controls show that the citric acid acts in two ways. It inhibits the growth of many of the common organisms found in the throat for they cannot thrive at p.h. of 6.4. Also it quickens the growth of the diphtheria bacillus and apparently serves as a source of carbon required in that growth.

ARCHIBALD MALLOCH

Results of Removal of Tumours of the Spinal Cord. Adson and Ott. *Arch. Neurol. and Psych.* Vol. 8, No. 5, November, 1922.

The authors report a series of 112 laminectomies for spinal cord tumour, from the Mayo Clinic.

Diagnosis. The history of pain when lying down, exaggerated by coughing, sneezing or jarring, while relieved by walking about; or pain along the course of the sciatic nerve, persisting, unrelieved for years is very suggestive of intradural tumour. Spinal puncture, when it reveals a xanthochromatic fluid, is of confirmatory significance as is also the occurrence of dry tap in the fourth lumbar interspace. The rate of progress depends upon the type of tumour, the signs of pressure on the cord being registered earlier in the presence of hard, encapsulated tumours. Special disturbances of sensation depend upon the position of the tumour in relation to the cord.

Type of tumour. These may be bony, cartilagenous or fascial when they originate from the vertebrae or tissues of the spinal canal; endotheliomatous or fibromatous when they arise from the meninges and gliomatous when they take origin from the cord itself. Two of the cases revealed tuberculoma and two gumma of the cord.

Location. Fifty-nine occurred in the dorsal cord, eighteen in the cervical, and nine in the lumbar cord. In twenty-seven cases, no tumour was found.

Results of operation. In the series of 112 laminectomies, tumour was found in eighty-five cases. Of these sixteen were not removed. Seventy-nine patients are living; twenty-two are perfectly well and at work; seven are improved and doing a little work; twenty-one are improved but not at work and fourteen are helpless; thirty-four died either in the hospital or after discharge, with an average time of two years following the operation. Tumour of the spinal cord is more common than is realized; many are overlooked or found too late. The best results are obtained by early operation.

F. H. MacKay

Shall We Decompress for Choked Disk?

Sachs, B. *Arch. Neurol. and Psych.*, Vol. 8, No. 5, November, 1922.

After an experience of twenty-nine years, during which time, decompression for the relief of choked disk, was performed, the author asks, "Is the operation ever worth while?" A revision of 140 cases shows ninety-five to have been localized at examination while forty-five were completely unlocalizable. The occurrence of choked disk in relation to the site of the tumour is given:

Cerebellar tumours—out of nineteen cases, seventeen showed choked disk; hypophyseal tumours—three out of fifteen, presented the condition; frontal lobe tumours—nine out of thirteen gave positive finding; tempero-sphenoidal tumours—nine out of ten, presented swelling of the disk; angle tumours—four out of eight cases were accompanied by choked disk.

In thirty-eight cases of this series, decompression was performed, solely for the relief of the papillo-edema and of these thirty-eight cases, of which the subsequent history is known, twenty-nine showed no recession in the swelling. Five of these were later complicated with optic atrophy. Four of the cases showed distinct improvement, but, as the author later points out, improvement is not unknown in the absence of operation.

His conclusion is, that decompressing operations, pure and simple, whether of the sub-temporal or sub-occipital variety, promise little for the relief of the choked disk. Instead of performing this operation, every effort should be made to attack the tumour itself, with a view to removal and before the patient is worn out and discouraged by unproductive operative measures.

F. H. MacKay

Latent Neurosyphilis in Eight Per Cent. of Medical Patients Ignored Owing to Neglect of Lumbar Puncture.

Gray, H. *Am. J. M. Sc.*, 165-384 (March) 1922.

The necessity of lumbar puncture in every syphilitic patient with repetition every year, if found positive, until a negative finding is obtained, is stressed in this article. Examination of sixty-two medical cases, all of which were considered non-syphilitic, revealed the presence of syphilis in eight cases, and in five of these, there was involvement of the central nervous system. Lumbar puncture should be done on every syphilitic patient and repeated annually until the fluids are found to be negative to all reactions.

F. H. MacKay

SURGERY

Ankylosing Operations in the Treatment of Pott's Disease in the Adult.

Estor. *Presse Médicale*, October 14, 1922.

This question, one of three taken up at the Fourth Congress of the French Orthopaedic Society (Paris, October 5, 1922), was discussed by Prof. Estor, of Montpelier.

His conclusions were (1) that it was not indicated in children, but was logically employed in the adult, without, however, replacing a prolonged immobilization, usually three years; (2) the operation has given good results and should meet with greater favour in France; (3) the graft undoubtedly lasts strongly for some time; (4) the Albee method is one most generally adopted; (5) a bone graft influences favourably abscess formation, nervous complications, and pain, but he does not think it can have an influence in reducing the deformity.

Dr. Putti, of Bologna, did not evidence any enthusiasm over ankylosing operations, though recently returned from America. He preferred the Hibbs to the Albee operation.

Dr. Delchef, of Brussels, wished to know why children should not also be operated on, and emphasized the necessity of operating early.

Dr. Etienne Sorrel, of Paris, advised that ankylosing operations should be reserved for adolescents or adults in a late period of the disease. He recommended Albee's instruments as the best.

Dr. Lance, of Paris, spoke favourably of the Hibbs' operation, especially since he had used it in cases of paralytic scoliosis.

Dr. Mauclaire, of Paris, held that ankylosing operations should be used only in cases of advanced bone destruction. In dorso-lumbar and lumbar cases it was unnecessary and in cervico-dorsal or high dorsal cases it seemed to lead to meningitis and was, therefore, contra-indicated.

Dr. Patel, of Lyons, reported a successful cure in a woman of thirty-five, brought about by an ankylosing operation.

Dr. Charles Martin du Pan, of Geneva, spoke favourably of heliotherapy and quoted successful cases in children who had had grafts.

J. A. Nutter

Involvement of the Lymph Nodes in Carcinoma of Rectum McVay, J. R. *Annals of Surg.*, December, 1922, p. 755.

Cancer of the rectum constitutes about 80% of all carcinomata of the intestinal tract. It occurs usually in the sixth decade and is more common in males than in females.

The duration of symptoms is usually under one year, with an average of eight months.

The selection of site is 63% in the rectosigmoid, 36% in the ampulla and 7% in the anal canal.

The usual type of growth is adeno-carcinoma, which develops from the crypts or glands of Lieberkuhn. They invade the muscular coat of the bowel and by means of the intermuscular lymphatic network progress in an encircling direction following the course of these vessels.

Invasion of the lymph nodes may occur at any time after the growth has infiltrated the submucosa. Lymphatic invasion is late, more cases being inoperable because of local extension than of gland metastasis. Liver metastasis is more common than gland metastasis.

The paper is based upon the study of one hundred specimens removed at the Mayo Clinic. The glands were carefully dissected and preserved and note made of their location in relation to the bowel and to the growth. Fifty-three per cent. of the specimens did not show gland involvement; thirty per cent. slight involvement and seventeen per cent. marked involvement.

In analyzing these three groups it was noted that neither sex nor age had any significance. In group three, however, the average duration of symptoms was considerably less than in the other groups and the growth decidedly smaller, seeming to indicate that the more malignant growths produced more definite and distressing symptoms and forced the patient to seek early relief.

In group 1,—(no glandular involvement) the growths were above the average in size, were protuberant into the lumen of the bowel and in cross sections showed little, if any, tendency to invade the muscle wall.

In group 2,—The growths were not so protuberant but showed a tendency to invade the muscle wall and the fatty tissue around the bowel, thus to spread by direct extension. The glands invaded are those nearest the site of greatest direct extension. Gland involvement is slow and the type of cell in the metastasis thus shows advanced cell differentiation.

In group 3,—The growths are small and ulcerating. They spread into the muscle coats early but show little tendency to invade the surrounding fat. Glandular metastasis occurs early before there is time for direct extension into surrounding tissue.

Early glandular involvement can only be ascertained by careful sectioning of the whole gland.

Systematic examination of the glands affords a fairly accurate idea of the prognosis in a given case.

A. T. Bazin.

The Trans-olecranon Approach in Traumatic Lesions of the Elbow.

Vulliet, H. *Presse Médicale*, December 9, 1922, p. 1,065.

The paper concerns itself with fractures of the elbow in childhood, irreducible without operative interference. The writer's indications for this operation are: (1) fracture of the external condyle with the fragment displaced backward and turned roundabout benefits by immediate operation. In most cases a small external incision suffices, but where this is insufficient, the joint should be opened by cutting through the olecranon. Without good replacement this fracture is apt to leave much deformity. (2) In transcondylar fractures near the epiphysis it is generally possible to maintain good reduction without operation. In exceptional cases, however, with severe displacement laterally and posteriorly, an operation is necessary, and here the trans-olecranon approach is ideal, which exposes the whole joint. The operation itself is briefly described. A removable nail is used to fix the fragment. The olecranon is replaced by fine metallic suture. No drainage is used. Mobilization begins gently about the tenth day and removal of the nail about the fourteenth day. Two illustrative cases are cited. J. A. Nutter

Non-Tuberculous Arthritis of the Hip.

Broca, A. *Presse Médicale*, November 1, 1922, p. 941.

The writer points out that all hip arthritides centre on the possibility of tuberculosis, and that not only are there numerous non-tuberculous arthritides, but tuberculosis itself varies in its intensity—hence the difficulty of diagnosis. He attaches little importance to the tuberculin reaction, save when negative. (1) In speaking of caput planum (Legg-Calvé), he does not think it due to malformation of the acetabulum, nor to trauma, there being no history of this in his ten cases. (2) Speaking of mild cases of arthritis with a limp, he insists that it is impossible to differentiate these at once from tuberculosis, and points out that even tuberculosis may present intermittent periods of freedom from symptoms. He advocates, in doubtful cases, two weeks rest in bed and two weeks on the feet. If signs still persist we know that a chronic arthritis is present of which tuberculosis is the probable cause. Of the non-tuberculous cases, some may be "growing pains," others luetic, and others may turn out to be caput planum. (3) Sudden dislocation, almost always iliac, is peculiar to the hip. It is sometimes preceded by an acute arthritis, and the x-ray may show no bone lesion. It should be reduced at once. This may be due to tuberculosis, typhoid, influenza, or to an osteomyelitis. Another lesion due to osteomyelitis is separation at the epiphyseal line, the head remaining in place, the neck dislocated upward. (4) In acute arthritis the difficulty is to decide whether pus is present. The general signs and the use of an exploring needle help to differentiate this from an acute rheumatism. Acute suppurative arthritis, the result of osteomyelitis, should be treated by resection of the femoral head for drainage, whether the head be infected or not. It is frequently seen in nursing infants and is generally very severe when caused by staphylococcus or streptococcus, but benign when caused by the pneumococcus, which type of infection is happily more frequent. Free drainage is necessary. (5) In speaking of chronic hip arthritis suspected of tuberculosis but without definite proof, Dr. Broca says we know little of syphilis of the hip. He notes, however, that bilaterability, a sign of syphilis in the knee, is here often a sign of tuberculosis in hip conditions. In discussing caput planum, he evidently holds that some cases, at least, are tuberculous in origin. He notes three cases of caput planum following chickenpox, with complete restoration of the structure and function of the hip. (6) In closing, he speaks at length of the difficulty of differentiating between tuberculosis and osteomyelitis, quoting a case in point, where the latter disease finally made its presence certain by the discovery of a typical focus, with sequestrum, in the humerus. He speaks of rapidly spreading tuberculosis which simulates osteomyelitis, and of a differential diagnosis between tuberculosis and non-suppurative osteomyelitis, with x-rays giving no assistance, made by the aspiration of a few drops of sterile fluid. He has made his diagnosis in general by watching the case for years, when the presence of a cold abscess or of a sequestrum has cleared up the diagnosis.

J. A. Nutter

Chronic Non-Tuberculous Arthritides of the Hip in Childhood.

Sorrel, Etienne. *Presse Médicale*, October 14, 1922.

Dr. Sorrel described (1) haemophilic arthritis; (2) traumatic arthritis following fractures, coxa vara, coxa valga, and congenital dislocation; (3) arthritis accompanying infectious diseases, as pneumonia, scarlet fever, smallpox, measles, typhoid, syphilis, gonorrhoea, osteomyelitis; (4) dry arthritis deformans, more frequent in adolescence than has been thought; (5) osteochondritis deformans (Legg-Calvé).

On this last subject Dr. Sorrel spoke at length. It had been suspected by Kirmisson and others before it was discovered and given a name by Legg, of Boston, and later by Calvé (Berck) and Waldenström, the latter considering it tuberculosis of the neck of the femur. It is generally seen in boys of five to nine years and is rarely bilateral. Its pathologic anatomy is little known and almost wholly through x-rays. The epiphyseal disc is flattened and may be fragmented; the femoral neck is often thick; coxa vara as a rule is not present. The onset is insidious, with pain and limp on walking. Its course is benign, leading neither to ankylosis nor to arthritis deformans. As to cause, Legg's traumatic hypothesis is not proved. Is it congenital? (Murk Jansen) Sorrel thinks it is inflammatory in origin, but cannot indicate the source. The endocrine glands have been thought the cause, as with inflammation of the scaphoid bone of the foot, and hereditary syphilis has also been considered.

Dr. Nové-Josserand (Lyons) discussed the relationship of osteochondritis with arthritis deformans juvenilis and with coxa vara. He thinks them all forms of the same disease, with different anatomic aspects.

Dr. Froelich, of Nancy, described (1) dry progressive arthritis with congenital hip dislocation; (2) arthritis with progressive deepening of the acetabulum; (3) osteochondritis (Legg-Calvé), which latter is a form of epiphysitis, together with essential coxa valga.

Dr. August Broca (Paris) deplored the vague term coxalgia as leading to confusion. He thought that some cases of osteochondritis (Legg-Calvé) were of a tuberculous nature.

Drs. Albert Mouchet and Carle Roederer make no distinction between osteochondritis and osteoarthritis in childhood, thinking them probably identical.

Dr. Andre Bendu (Lyons) reported cases of osteochondritis following trauma and one case following ricketty deformities.

Dr. Vignard (Lyons) told of arthrotomies in two cases of osteochondritis. From one he removed two small fragments of bone of ivory hardness resembling sequestra. In the other case nothing particular was found. Dr. Vignard considered these cases showed plainly that osteochondritis was neither due to an incomplete hip dislocation nor to a congenital deformity of the acetabulum.

Dr. Judet (Paris) divides non-tuberculous hip arthritides into (1) traumatic; (2) congenital abnormalities; (3) essential coxa vara; (4) those due to infections; (5) those of unknown origin, possibly due to hereditary syphilis or an attenuated tuberculosis.

Dr. Lance maintained that osteochondritis could lead to permanent deformity, as opposed to Dr. Sorrel's opinion that it never did so. He was also impressed by the rôle of congenital syphilis as a causative agent.

Dr. Kirmisson spoke of the relationship of coxa vara with adiposity and thyroid insufficiency.

Dr. Froelich, of Nancy, thought the epiphysitides of the period of growth were due rarely to trauma, but generally to systemic infection, with or without the influence of the endocrine glands.

J. A. Nutter

Pathogenesis and Treatment of Deformities of the Great Toe. Mouchet, Albert. *Presse Médicale*, October 14, 1922.

1. Hallux valgus is seen especially in the adult, and a little more often in women. It is generally bilateral and often seen with flat feet. It is congenital more often that it is supposed to be. Young explained this by the intermetatarsal bone, a supernumerary bone between the internal cuneiform and the first and second metatarsals. This is probably exceptional. The mechanical action of improper footwear is undeniable, but Kirmisson holds that the first place in the list of causes should be given to arthritis of various kinds. Well fitting shoes should cure most cases of hallux valgus. They should be long enough and broad enough. In young subjects forcible correction followed by immobilization will cure. If a proper shoe fails to relieve, one must operate. In elderly persons palliative measures are best. Tendon operations will not cure and amputation of the great toe is not recommended, except possibly in elderly persons.

Schede extirpates the painful bursa and resects the exostosis, a plan which is of service only in mild cases.

Reverdin's operation consists in carrying out Schede's procedure and then removing a wedge of bone from the metatarsal head, the base to the inner side, allowing correction. This operation is popular. The resection of the metatarsal head (Hueter) is an excellent and popular operation.

Edmond Rose and Lovett resect the metatarsophalangeal articulation and extirpate the sesamoids.

Mauclaire (Paris) does oblique resections of the head of the metatarsal and of the base of the phalanx. Postoperative care is of the highest importance.

2. Hallux varus is either acquired, which is rare, or congenital, which is seen more frequently, as a supernumerary toe. The treatment is surgical, and may be amputation.

Mr. André Trèves (Paris) described an operation where the cartilage on the metatarsal head was kept and placed against the raw bone left by resection. He transplanted the long extensor to the inner side, after lengthening it if necessary.

Dr. Tixier, of Lyons, Dr. Paul Hallopeau, of Paris, Dr. Lance, of Paris, and Dr. Rocher, of Bordeaux, all favoured simple resection of the head of the first metatarsal. J. A. Nutter

ANAESTHETICS

A Lecture on the Medico Legal Position of the Anaesthetist. Mortimer, J. D. *Lancet*, December 2, 1922.

Formerly when operations were comparatively few and simple, the surgeon took all the responsibility for the anaesthetic as well as for the operation. Such a condition may still obtain in an emergency, but for the most part the anaesthetist's responsibility has increased as the surgeon's authority over him has lessened.

Differences of opinion between surgeon and anaesthetist may occur in connection with such questions as the course to be pursued in such emergencies as the entry of fluid into the air passages, or when either operator or anaesthetist has shown himself incompetent. The operator may offer to assume all responsibility, but it can only be thus shifted if the anaesthetist is under his control.

As a rule no person may be anaesthetized without consent, in the case of a child, that of the parent or guardian, in the case of an insane person, that of someone in authority. Administration, without consent, may be justifiable though illegal in the case of a patient not able to give consent, on account of delirium or shock, or in the case of a child when its parents cannot be communicated with.

Consent may have been given in the case of an adult, who changes his mind immediately after the starting of the anaesthetic. If there is reasonable ground for belief that the patient's power of judgment has been lost, one is justified in proceeding in spite of protests.

An anaesthetic should never be given except in the presence of a third person for at least three reasons. These are (1) To prevent allegations of administration without consent. (2) If struggling occurs the patient may be injured and sue for damages. Under such conditions if no third person were present the anaesthetist would be severely penalized. (3) In the case of a woman there may be erotic hallucinations and an accusation of assault may be made afterwards in good faith or for the purpose of blackmail.

A reasonable amount of skill and care is required of every medical practitioner who administers an anaesthetic. A higher standard would be expected of one holding a hospital appointment as anaesthetist.

It is quite possible that if one who has only average skill undertakes to give an anaesthetic in a case requiring special skill and experience, where these could be obtained, he might be penalized in the event of some ill effects ensuing. The anaesthetist may be sued for injury done to the patient such as the breaking of a tooth in forcibly opening the mouth, or he may be sued for the negligence of a student working under his supervision. In these cases the hospital would not be liable to damages, having discharged its duty to the public by exercising due care in appointing members of the staff. W. B. Howell

Anaesthetics in Common Operations. Buxton, Dudley W. *The Practitioner*, January, 1923, p. 121.

In most cases ether should be used, preceded by nitrous oxide, A.C. (alcohol 1 part, chloroform, 9 parts) or ethyl chloride. Ether vapour is better when warmed, being more easily inhaled, less being required and the after effects not so marked.

Pulmonary after effects are due to overdosage. A preliminary hypodermic injection of one hundredth of a grain of atropine, one hour before the administration, to all except babies and young children should be given. The benefit is shown partly by the smaller amount of after-vomiting, as there is less ether-saturated mucus for the patient to swallow. In cases which can be watched afterwards by a nurse, morphine gr. 1/6 and scopolamine gr. 1/100 should be given with the atropine. When the Trendelenburg position is used it is specially important not to ignore cyanosis Oxygen should always be at hand. When the tongue has to be held forward a ligature should be passed through it from side to side.

In the removal of tonsils and adenoids, ethyl chloride may be used in the case of children, or nitrous oxide or ethyl chloride followed by ether, but not to such an extent as to abolish the laryngeal reflex. Atropine should be given beforehand, without morphine or scopolamine.

In Ludwig's Angina, A.C. mixture with oxygen should be used and measures should be ready for immediate intubation if breathing stops.

In connection with the setting of fractures and dislocations it is well to remember that though chloroform causes muscular relaxation more quickly than ether, the relaxation is not as complete.

In circumcisions in children, ether should be used with perhaps a few drops of A.C. mixture at first. There have been many fatalities in this operation from the anaesthetic. Complete anaesthesia is essential, but it should not be deeper than is absolutely necessary.

Spinal anaesthesia when used for hernias and abdominal operations should be associated with a general anaesthetic to avoid psychic shock. Patients have become maniacal for weeks when this has not been done.

In all septic cases chloroform should be avoided as it delays healing and is liable to produce post-operative acidosis. In these cases, under nitrous oxide there is a special tendency to dilatation of the heart.

The most usual cause of abdominal rigidity is deficient oxygen. This must be remedied by the use of oxygen, rhythmical chest compression, and the establishment of a free air way.

Morphine increases the tendency to rigidity whereas scopolamine and atropine neutralize this effect of morphine.

Where there is marked cyanosis due to a lung condition, chloroform by the dosimetric method should be given with oxygen. Great care should be taken to keep the air way free as there is a tendency to excessive secretion. Both ether and nitrous oxide are contraindicated. Moderate degrees of albuminuria do not contraindicate ether or nitrous oxide. Anaemia is associated with a special tendency to circulatory failure.

With alcoholics, the operation should not be commenced until a quarter of an hour after the usual signs of anaesthesia have appeared.

W. B. Howell

In a recent number of the *British Medical Journal*, Donald Paterson describes "Ulcerative Stomatitis in Children, and its Treatment." This form of stomatitis occurring in adults during the war was known as "trench mouth." The fusiform bacillus and Vincent's spirochaete are present. The signs of the disease in children are the same as in adults; swelling, redness, oedema and extreme tenderness of the gums about the teeth. There may be actual ulceration of the gums. The lining of the cheek in contact with the gums may also show infection. Pressure on the gums may, or may not, cause pus to appear at their margins. The breath is fetid and the temperature is generally raised to 101°. The lymph nodes beneath the angle of the jaw are swollen and tender. It occurs in children of the hospital class after primary dentition is well advanced.

To the gums is applied the following mixture (like that used during the war for adults): liquor arsenicalis 2 drachms, vin. ipecac. 2 drachms, glycerin 2 drachms, aq. menth. pip to 1 oz. This mixture is poisonous, so for small children, 15 drops in 2 drachms of water are applied with muslin on the end of the finger or with a swab. In children old enough to spit up after the application, a few drops of the undiluted mixture were used. It is said the arsenic is specific for the spirochaete and the vin ipecac. for the fusiform bacillus. Potassium chlorate was also given, 12 grs. in the twenty-four hours to children under 1 year, and 18 grs. to those under two years; care being taken to avoid meal-times as the drug causes indigestion. After twenty-four hours the acute symptoms often subside. The condition tends to recur. Sometimes the parents show the same stomatitis and this may well be the origin of the infection in the children.

News Items

GENERAL NEWS

PRELIMINARY REPORT EXPERIMENTS WITH ETHYLENE AS A GENERAL ANAESTHETIC*

W. Easson Brown, M.B.

Toronto

Some six months ago it occurred to me that if a non-irritating gas having anaesthetic properties in excess of those of nitrous oxide could be found, the problem of satisfactory anaesthesia would be nearer a solution. At present the difficulty is well known. In order to get complete relaxation it would be necessary to give such a high percentage that the patient would be in danger of asphyxia, consequently nitrous oxide is not an ideal anaesthetic.

Owing to the fact that ethylene is said to be one of the active constituents of a certain commercial ether, it was thought that this would be a good gas to experiment with. In Frankel's *Standard Work* the only reference is to the effect that ethylene has little anaesthetic properties. Malisoff and Egloff state that ethylene is not poisonous in concentrations of 72%. A rather exhaustive search of the literature failed to reveal any further information.

Ethylene is an unsaturated hydro carbon having the formula C_2H_4. At ordinary temperatures and pressures it is a gas having a peculiar, slightly ethereal odour. Compressed pure ethylene can be put on the market without any great difficulty. With the conditions under which it would be used as an anaesthetic, it is non-explosive. It is readily compressible and the operations bound up with its liquefaction and storing are not likely to prove expensive or difficult. It is not a highly reactive gas and is not likely to form compounds in the body. The first problem naturally presenting itself was to determine if ethylene did possess anaesthetic properties. Of this there can be no doubt. Mice, rabbits, cats and dogs have been anaesthetized by us with ethylene, the length of the anaesthesia varying from a few minutes to over an hour. Mice and rabbits were anaesthetized by being made to inhale a mixture containing 80% ethylene and 20% oxygen. In order to get blood pressure readings, the animals were in other experiments first lightly anaesthetized with ether, an intra-tracheal canula introduced, a blood pressure recording apparatus fixed to the carotid artery and a sciatic nerve exposed, tied off and cut. The animal was then allowed to recover from the effects of the ether. Consciousness was apparently present, the eye reflexes were active and there was a rise of blood pressure showing a reception of pain stimuli on stimulation of the sciatic nerve with an electric current. There were also reflex movements. In order to save ethylene a small receptacle having a distensible top was now used. This receptacle had three inlets, one for each of ethylene, oxygen and nitrous oxide and one outlet for the delivery of the gases. It was quite air tight and contained a vessel partly filled with a solution of KOH for the absorption of CO_2. By means of a scale fixed to the distensible top the volume of the gases in the receptacle could be seen or given amounts of fresh gases could be added as desired. In this way a fair approximation of the percentages being breathed by the animal could be made. Ethylene and oxygen alone were used, the nitrous oxide inlet being for future experiments. A mixture of ethylene, 80%, and oxygen, 20%, was administered through the intra tracheal canula. In from three to five minutes the corneal reflex was abolished and the rise of blood pressure on sciatic stimulation was much decreased or abolished. The respirations were, as a rule, somewhat slower but the blood pressure remained good even at the end of an hour's anaesthesia. After the induction it was possible to materially increase the oxygen percentage to from 25% to 35% without increased response to nerve stimulation. With this increase of oxygen and relative decrease in ethylene percentage the corneal reflex became quite active thus showing a great field of possibility in using ethylene as an analgesic either alone or in combination with nitrous oxide. The recovery of the animals from the anaesthetic was quite rapid. After an hour's anaesthesia the animal moved its head slightly in less than one minute after the anaesthetic was stopped. In less than three minutes it moved its head from side to side and in less than five minutes attempted to rise.

It would, in view of the above facts, seem that ethylene is a definite anaesthetic agent. It will now be our aim to go more fully into the effect of ethylene on the blood pressure and the respiration trusting that we may be able to show that we have a more satisfactory anaesthetic than has yet been found.

In conclusion, I would like to state that all of the work on this subject has been done in the laboratory of the Department of Pharmacology at the University of Toronto, and I cannot too greatly emphasize the very great assistance which Professor Henderson has been in helpful suggestions as well as putting the facilities of his laboratory at my disposal. I wish also to thank Professor M. Boswell for hints on the method of production.

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FEDERAL INCOME TAX

Last year, the Ontario Medical Association procured from the Federal Income Tax Department, and published a statement relative to the deductions allowable to the practitioners of medicine in the matter of Income Tax returns. From the many reports received, this information was of considerable help to the Profession throughout the Province. With a view to again rendering service to the profession, the following information is published under the official authorization of the Federal Income Tax Department.

During the month of April, Income Tax Returns for the year 1922 must be filed by every practitioner. According to the Government ruling, the onus of procuring the necessary forms rests upon the practitioner; therefore, he should not wait for them to be mailed to him. At least twenty-five per cent. of the tax must be paid when the forms are filed.

In addition to the statutory deductions from Income, ($2,000 for a married man and $300 for each child under eighteen years of age; and $1,000 for a single man) the practitioner is entitled to the following deductions:

Rent—Where office is separate from your house, full rent, if actually paid. Office in your house, proportion of rent in the ratio of the proportion of house used for your business. This can usually be estimated as one-quarter or one-third.

Heat and Light.—For separate office, full amount. For office in house, same proportion as rent, *i.e.*, one-quarter or one-third.

Office Girl.—Full amount.

House Maid.—Same proportion as office rent, *i.e.*, one-quarter or one-third.

Telephone.—Full amount.

Automobile.—(1) Maintenance—Where only one car is used, 75% of the total cost of operating is allowed as chargeable to business. When a physician owns more than one car, and one is used solely for business purposes, the whole operating expense of that car is allowable. Note—No additional allowance is made for any part of the operating expense of the second car. (2) Depreciation—Applies as above; that is, on the basis of 75% for one car, or 100% for one of two cars, such depreciation being based on the following ratio: 1st year, 25%; 2nd year, 15%; 3rd and succeeding years, 10%.

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*Read before the Academy of Medicine, Toronto, February 20th, 1923.

Wherever you feel that the above does not fairly cover your case, it is suggested that you submit the matter to the local Inspector of Taxation.

Books, Instruments and Office Fixtures.—Depreciation of 10% per year of the original cost values.

House Owner with Office Therein.—In the proportion of the space used for office purposes, *i.e.*, as an average, one-quarter or one-third, you are allowed in this ratio, one-quarter or one-third of your taxes, interest on your mortgage, and insurance. In addition, you are allowed a depreciation of 2½% of the original cost value on a brick house, and 5% of the original cost value on a frame house, in the same proportion, *i.e.*, one-quarter or one-third. Proportion of interest on your house investment is not allowable.

Drugs, Office Supplies, Stationery, Stamps, etc.—Full amount.

Receipts.—If cash receipts only are shown, no bad debts are allowed; if accounts charged are shown, bad debts are allowed. It would appear that the simpler and more satisfactory return would be cash receipts. Be sure to state in the General Expense column the proportion of expenses shown, that is, one-quarter or one-third, as the case may be, so that the matter will not be referred back to you for explanation, or reduced by three-quarters or two-thirds.

Medical Society Fees.—Show Medical Society Fees as an abatement. Journal subscriptions, post graduate expenses and capital account are not yet considered deductable. These are some of the points which the Association has taken up with the Commissioner on Taxation, and upon which we will continue to press for favourable rulings.

The Sliding Scale (upwards) according to your income, is no doubt, ere this, familiar to you. It is available in printed form. If you are not perfectly certain as to the correct computing procedure, consult your local Inspector. Write the Secretary of the Association if there is any special point on which you would like us to get a ruling for you.

Dr. Sofie A. Nordhoff-Jung, of Washington, District of Columbia, U.S.A., has founded an annual prize of five hundred dollars bearing the title of "The Sofie A. Nordhoff-Jung Cancer Research Prize." This prize is destined for the encouragement of researches in the etiology, prevention and treatment of cancer, and will be awarded by a commission, composed of members of the University of Munich, Bavaria.

The international Congress of Surgery issues an advance programme for the meeting, which will occur in London, July 16-21. The sessions will be held under the presidency of Sir William Macewen. Among American surgeons who are included on the programme are the following: Drs. W. R. MacAusland, Boston, "Arthroplastics"; Harvey Cushing, Boston, "Surgery of the Endocrines"; C. Frazier, Philadelphia, "Surgery of Traumatic Nerve Lesions"; George Crile, Cleveland, "Operative Shock"; William J. Mayo, Rochester, "The Splenic Syndromes," and Major A. P. Hichens, Washington, "Serum and Vaccine Therapy." The arrangements for the congress are in the hands of the secretary, Dr. L. Mayer, who may be addressed at 7 Rue de la Loi, Brussels.

The Association pour l'exension des études pastoriennes, founded two years ago, has endeavoured to ameliorate, at least in some degree, the trying situation of university students, for whom the high cost of living makes it very difficult to continue their studies. The funds collected by this society enable young investigators to devote their time to research work in the Pasteur institutes and the biologic laboratories of France and its colonies. The scholarships that are accorded, on the recommendation of a committee of eight members presided over by Dr. Roux, director of the Pasteur Institute, amount ordinarily to 24,000 francs, and cover two years of study. Fifteen such scholarships have already been granted. The association, in order to be in a position to continue its work, has issued an appeal for funds, calling more particularly on those who, in the past, have themselves been indebted in any way to the Pasteur institutes.

Dr. Oskar Klotz, Med., 1906, who has latterly been engaged in re-organizing the pathological department of the University of Buenos Aires under the direction of the Rockefeller Foundation, has been appointed to the chair of Pathology in the University of Toronto, and will assume his new duties on July 1st, next. Dr. Klotz, who was formerly a member of the teaching staff of the Faculty of Medicine, McGill University, went to the United States in 1910, as Professor of Pathology in the University of Pittsburg and Director of the Magee Pathological Laboratory. His work in this connection and in association with the Rockefeller Foundation has been of the highest type and has won for him recognition as a leading pathologist.

We have to announce with very great regret the death, on January 23rd, of Dr. J. W. Ballantyne, of Edinburgh, after a short illness, which necessitated an operation from which he did not rally. We intend to publish a notice of his life and work in an early issue.

John D. Rockefeller recently purchased, for 40,000 francs, as a centenary gift to the people of the village, the cottage at Dôle, France, in which Louis Pasteur was born 100 years ago. The French parliament has given an additional sum of 20,000 francs with which the cottage will be remodelled into a public museum. It will be presented to the people of the commune of Dôle. The property and house formerly belonged to Pasteur's father, a tanner.

The Seventh Annual Clinical Session of the American Congress on Internal Medicine will be held in the amphitheatres, wards and laboratories of the various institutions concerned with medical teaching, at Philadelphia, Pa., beginning Monday, April 2nd, 1923. Practitioners and laboratory workers interested in the progress of scientific, clinical and research medicine are invited to take advantage of the opportunities afforded by this session. Inquiries may be addressed to the Secretary-General, Frank Smithies, M.D., 1002 N. Dearborn Str., Chicago, Ill.

At the International Congress of Ophthalmology held in Washington in April, 1922, Mr. Treacher Collins presented an invitation on behalf of all the Ophthalmological Societies of Great Britain and Ireland to hold the next Congress in London in the year 1925. The invitation was accepted on the motion of Professor Gullstrand, of Upsala, Sweden, seconded by Dr. Lucien Howe, of Buffalo, New York. A general committee consisting of representatives of the inviting Societies has since met and has formed an executive committee, empowered to make arrangements for the 1925 Congress. It is to be held in London during the four days, Tuesday 21st to Friday 24th July. The three official languages are to be English, French and German. The subscription for membership has been fixed at the sum of £2. Invitations will be sent to the principal Ophthalmological Societies or other representative bodies in every nation, asking them each to nominate a delegate to the Congress who would be responsible for promoting its interests in the country which he represents, so as to endeavour to make it a great reunion of all those interested in Ophthalmology throughout the world. The Executive Committee is composed of the following members: Mr. E. Treacher Collins, Chairman; Mr. J. Herbert Fisher, Vice-Chairman; Mr. Ernest Clarke, Treasurer; Mr. Leslie Paton, 29 Harley Street, London, W., and Mr. R. R. James, 46 Wimpole Street, London, W., Secretaries; Mr. A. B. Cridland; Mr. J. B. Lawford; Mr. Humphrey Neame; Sir John H. Parsons, F.R.S.; Mr. A. H. H. Sinclair.

WORKMEN'S COMPENSATION BOARD TARIFF FOR PROVINCES

	B.C.	*Alta.*	*Man.*	*N.B.*	*N.S.*	*Ont.**
AMPUTATIONS—						
Finger or toe, one	$ 10.00	$ 15.00	$ 10.00	$ 10.00	$ 10.00	$ 10.00
Each additional finger or toe	5.00	5.00	(all) 15	5.00	5.00	5.00
Metacarpal or Metatarsal, one	....	....	....	15.00	10.00	15.00
Each additional Metacarpal or Metatarsal	....	....	....	5.00	5.00	5.00
Arm	50.00	50.00	50.00	25 to 40	30.00	40.00
Forearm	50.00	....	50.00	25 to 40	30.00	40.00
Wrist	50.00	....	50.00	25 to 40	30.00	40.00
Shoulder, disarticulation	75.00	75.00	100.00	50.00	60.00	75.00
Hip, disarticulation	100.00	100.00	100.00	75.00	80.00	75.00
Thigh	60 to 75	70.00	75.00	50.00	50.00	60.00
Leg	50.00	50.00	50.00	25 to 40	30.00	40.00
Ankle joint	50.00	50.00	50.00	25 to 40	30.00	40.00
Foot	50.00	50.00	25.00	25 to 40	30.00	40.00
Hand	50.00	....	25.00	....	....	....
Knee	....	....	50.00	....	....	....
FRACTURES—Including after treatment—						
Potts Fracture	....	45.00	....	....	50.00	....
Skull, closed fissure, no operation	10.00	10.00	....	10.00	10.00	....
Skull, open fissure, with brain symptoms and no operation	40.00	40.00	....	30.00	....	....
Skull, with operation	100.00	100.00	75 to 150.00	65.00	....	....
Fingers, one	10.00	10.00	....	5.00	10.00	5.00
Fingers, each additional	10.00	5.00	....	5.00	5.00	10.00
Hand	....	20.00	....	....	....	....
Metacarpal, one	....	....	....	5.00	10.00	5.00
" two or more	....	....	....	5.00 ea	5.00 ea	10.00
Radius	25.00	30.00	35.00	20.00	20.00	20.00
Ulna	20.00	20.00	35.00	20.00	20.00	20.00
Radius and Ulna	45.00	40.00	50.00	25.00	25.00	25.00
Humerus	40.00	50.00	....	25.00	30.00	25.00
Upper Arm	....	....	60.00	....	....	....
Wrist	....	....	25.00	....	....	....
Toe, one	10.00	10.00	15.00	5.00	10.00	10.00
Toe, each additional	....	5.00	....	5.00	5.00	....
Metatarsal, one	....	....	....	5.00	10.00	10.00
" each additional	....	....	....	5.00	5.00	....
Foot	20.00	20.00	40.00	....	....	....
Tibia	30.00	35.00	50.00	30.00	30.00	30.00
Fibula	20.00	25.00	30.00	30.00	10.00	20.00
Tibia and Fibula	50.00	50.00	75.00	40.00	40.00	40.00
Femur	70.00	70.00	100.00	30 to 50	50.00	50.00
Jaw	25.00	25.00	50.00	20.00	20.00	20.00
Malar and Nasal Bones	12.50	12.50	....	10.00	10.00	10.00
Clavicle	25.00	25.00	30.00	15.00	15.00	15.00
Scapula	20.00	20.00	25.00	15.00	....	15.00
Ribs, one or more	10.00	10.00	20.00	5.00	10.00	5.00
Breast Bone	....	....	25.00	....	....	....
Patella	60.00	20 to 70	50.00	20 to 40	30.00	20 to 40
Pelvis	50.00	50.00	60.00	10 to 40	....	10 to 40
Coccyx	....	....	15.00	....	....	....
DISLOCATIONS—including subsequent attention—						
Finger, one or more	5.00	5.00	5.00	5.00	5 to 7.50	5.00
Toes, one or more	5.00	5.00	5.00	5.00	5 to 7.50	5.00
Thumb	....	....	10.00	....	....	....
Metacarpal or Metatarsal, one or more	....	....	....	5.00	5 to 7.50	10 00
Wrist	15.00	15.00	10.00	10.00	10.00	10.00
Elbow	25.00	25.00	20.00	15.00	15.00	15.00
Shoulder	25.00	25.00	20.00	15.00	15.00	15.00
Clavicle	15.00	20.00	....	10.00	10.00	10.00
Jaw	10.00	10.00	10.00	10.00	5.00	10.00
Sacroliac	15.00	....	....	....	....	10.00
Hip	50.00	50.00	35.00	25.00	30.00	25.00
Knee	50.00	50.00	35.00	20.00	25.00	20.00
Patella	15.00	....	....	....	....	10.00

*A bonus of 20% is added to fees shown by the Workmen's Compensation Board of Ontario.

WORKMEN'S COMPENSATION BOARD TARIFF FOR PROVINCES—*Continued*

	B.C.	*Alta.*	*Man.*	*N.B.*	*N.S.*	*Ont.**
DISLOCATIONS—*Continued*						
Ankle	20.00	....	20.00	15.00	15.00	15.00
Tarsus	....	....	....	....	....	10.00
Semilunar cartilage of knee	....	10.00	....	....	10.00	....
OPERATIONS, including after treatment—						
Suturing, without anaesthetic	....	5.00	....	....	.50	....
Suturing, with local Anaesthetic	5.00	....	....	5.00	1.00	....
First treatment of wounds not requiring suturing	....	3.00	....	2.00	....	....
Incision of Abscess, without general Anaesthetic	....	....	....	....	.50	....
Incision of Abscess, with local Anaesthetic	....	3.00	....	....	....	....
Incision of Abscess, with general Anaesthetic	....	5.00	....	....	3.00	....
Removal of Eye	....	....	....	35.00	40.00	40.00
Extraction of Steel from Interior of eye ball	....	....	....	50.00	....	50.00
Iridectomy	....	....	....	50.00	....	50.00
Removal of foreign body from eye	5.00	....	....	3.00	....	....
Hernia, operation for radical cure	60.00	75.00	75.00	60.00	60.00	....
Hernia, radical cure of double hernia	....	110.00	100.00	75.00	....	....
Hydrocele, radical cure	....	....	40.00	25.00	....	....
Excision of Diseased bone	....	....	10 to 50	....	....	....
Incision into joint for drainage	....	....	10.00	....	....	....
Incision into joint for removal of cartilage or foreign body	....	....	25 to 100.00	....	....	....
Tendons, repair of	....	....	25 to 50	....	....	....
Chest, Aspiration of fluid	....	....	10.00	....	....	....
Chest, resection of ribs for drainage	....	....	40.00	....	....	....
Spine, Laminectomy	....	100.00	100.00	....	....	....
Removing Semi-lunar cartilage of knee	75.00	100.00	....	....	....	....
Dressing wounds, no anaesthetic	....	5.00	3.00	....	....	....
Dressing wounds, with general anaesthetic	....	20.00	15.00	....	....	....
Skin grafting	15 to 25	....	....	....	....	....
Laparotomy	50.00	....	....	....	....	....
Minor operations, not otherwise provided for	....	....	....	....	....	10.00
Major operations, not otherwise provided for	....	....	....	....	....	60.00
Plaster of Paris dressing	....	3 to 5	....	....	....	....
ANAESTHESIA—						
General Anaesthesia for Major operations	5 to 7.50	10.00	5.00	10.00	10.00	5.00
Anaesthesia for minor cases	....	5.00	....	6.00	5.00	....
Assistant Anaesthetist	....	....	5.00	10.00	....	5.00
X-RAY—						
Hand	5.00	6.00	....	5.00	5.00	3.50
Foot	5.00	6.00	....	5.00	5.00	5.00
Leg	5.00	6.00	....	6.00	7.50	5.00
Pelvis or Hip	10.00	8 to 10	....	8.50	10.00	7.50
Spine or head	10.00	10.00	....	8.50	10.00	10.00
Eye	15.00	20.00	....	....	15.00	....
Elbow	5.00	6.00	....	....	7.50	....
Shoulder	7.50	8.00	....	6.00	7.50	5.00
Knee	7.50	6.00	....	....	7.50	....
Clavicle	....	8.00	....	....	....	....
VISITS—						
First visit at plant, home or hospital	3.00	3.00	....	3.00	3.00	2.50
First visit at office	1.50	....	....	2.00	2.00	1.50
Subsequent visits at home	2.25	2.00	....	2.00	2.00	1.50
Subsequent visits at office	....	1.50	....	1.00	1.50	1.00
Night visits away from office	5.00	5.00	....	3.00	3.00	2.50

*A bonus of 20% is added to fees shown by the Workmen's Compensation Board of Ontario.

QUEBEC

An endowment of $25,000.00 by John Baillie, of Montreal, for the departmental library of Chemistry in McGill University, was announced recently by Dr. R. F. Ruttan, Director of the department. The endowment will be a memorial to the donor's son, Lieutenant George Irving Baillie, a former student who was killed in action during the war.

A memorial tablet in commemoration of McGill University undergraduates who fell during the war is to be placed in the lounge room of the McGill Union, and will bear the following inscription—"To the memory of our comrades in arms, those sons of old McGill who fell in the service of her country, 1914-1919." This tablet is placed by the Returned Undergraduate Association of McGill. Designs for the tablet are invited from all graduates and undergraduates of the University, and will be judged by Professor Ramsay Traquair. The author of the successful design will be entrusted with the execution of the tablet, which will be of bronze. The respective faculties of the university have their own special memorials, but this is the first memorial to the whole body of McGill men who fell.

A series of luncheon lectures on Industrial Medicine has been arranged by the Governors of McGill University in order to bring prominently before the manufacturing and industrial sections of the community the importance of making use of preventive and sanitary medicine in industry. The plan is to follow the lines of the Canadian Club and hold a series of five luncheons to be followed by short addresses by recognized experts on subjects intimately associated with industrial medicine. The lecturers have been chosen from among those medical men who have had much experience in connection with the various phases of medicine in industry. Each lecturer will deal with the special phase in which he is most interested, and the series should prove valuable to all employers of industry in bringing before their notice the importance of medical science when applied to the health of the employee. The complete course as announced will comprise the following lectures:

Feb. 9th.—Industrial Medicine, by Dr. B. L. Wyatt, Director of the Laurentide Health Service.

Feb. 16th.—Periodic Health Examination in Industry, by Dr. Haven Emberson, Columbia University.

Feb. 23rd.—Industrial Sanitation, by Dr. George C. Whipple, Harvard University.

March 9th.—Industrial Health from the standpoint of Tuberculosis, by Dr. Linsly Williams, National Tuberculosis Association.

March 16th.—The Physician in Industry, by Dr. W. A. Sawyer, Medical Director of the Eastman Kodak Company.

Another course of lectures on Social Problems will prove of special interest to those engaged in social work. The programme includes such lectures as "The City at the Cross Roads," by Prof. Arthur J. Todd, Ph.D., author, lecturer, and social worker; "The Family as Main Street sees it," by Rev. Peter Bryce, Chairman of the Mothers' Allowance Commission, Ontario; "The Story of the City Milk Supply," by Dr. T. A. Starkey, Strathcona Professor of Hygiene, McGill University, and "The New Canadian Immigration," by Professor Gilbert Jackson, University of Toronto.

The Library, comprising several thousand volumes on the history and development of medicine, bequeathed by Sir William Osler in his will to the McGill University, will occupy a large room formerly used by the Department of Anatomy on the top floor of the New Medical Building directly opposite to the Medical Library. The room is being entirely remodelled for its reception, and when completed will form a research Library and a permanent memorial to Sir William. The entrance to this library will be through a doorway of marble and from the entrance through a row of columns the visitor will look down the whole length of the Library to the bust of the great physician. The books will be placed in alcoves and portions of the wall not covered by the volumes will be panelled in oak. The walls will be emblazoned with the arms of the four universities with which Sir William was connected, McGill, The University of Pennsylvania, Johns Hopkins University and Oxford University, and the central wall will be emblazoned with Sir William's coat of arms. Tables and chairs for students and cases for rare books will complete the furnishings, and the name of the Library will be inscribed in Latin over the doorway. The work is expected to be complete by the end of the summer when the books arrive. They will be brought to Canada by Dr. W. Francis, the nephew of Sir William Osler, who will afterwards act as Librarian of the collection. The books are at present being catalogued at Oxford.

ONTARIO

The friends of the Homewood Sanitarium, of Guelph, Ont., will learn with a great deal of regret, that, owing to ill-health, Dr. A. T. Hobbs, the Medical Superintendent of the Institution for so many years, has resigned his position. Under his direction the Sanitarium has made great progress, and has extended its field of activities widely. It has been a great help in times of trouble to many of us, and its reputation now ranks second to none in the Dominion.

It will give great satisfaction, however, to hear that Dr. Hobbs' place has been taken by Dr. Clarence B. Farrar, a graduate of Harvard College and Johns Hopkins University. Dr. Farrar received his initiation in the practical study of mental diseases as Asst. Physician in the Sheppard-Pratt Hospital, Baltimore, under such able teachers as Stewart Paton and Edward Brush. After two years of special graduate study in Heidelberg University and in France and England, he received the appointment of Assistant in the Carnegie Institute of Washington. From 1904 to 1913 he held the position as Asst. physician and Director of the Laboratory at the Sheppard and Enoch Pratt Hospital, of Baltimore. From 1913 to 1916 he was Asst. physician of the New Jersey State Hospital for Mental Diseases, visiting Neurologist at the Mercer Hospital, Trenton, N.J., and Lecturer in Abnormal Psychology, Princeton University.

Although a citizen of the United States, he served in the Canadian Army Medical Corps from 1916 to 1919 as Captain and Major, being Psychiatrist to the Military Hospital Commission from 1916 to 1917, and since December, 1918, he has been Chief Psychiatrist in the Dept. Soldier's Civil Reestablishment, at Ottawa. Dr. Farrar is a member of the American Psychiatric Association and the Ontario Neuro-Psychiatric Association. He has published numerous articles in the field of Neuro-Psychiatry, Brain Histology and Histopathology. We all wish Dr. Farrar all the success which he so properly deserves in his new undertaking. C.K.R.

The annual Health Report of the City of Hamilton published by Dr. Jas. Robert, M.H.O., makes very interesting reading. He and his active co-workers are to be congratulated on the way in which they have carried out the details of their many activities. The death rate of 9.8 per 1,000 is the lowest in the history of the city. The figures on infantile mortality are remarkable. Excluding premature and still births, 180 deaths occurred in infants under one year of age; in other words, there were only 58 deaths per 1,000 of living births. This rate for 1922 is only one-third of the rate for 1905. These figures and the percentages given in the report show that if the infantile death rate for 1921 had prevailed in 1922, then 240 babies under one year of age, rather than 180, would have died.

The work of the Health Centre is fully described. It is situated in the old library building and was opened in 1921. The Tuberculosis Clinic is in charge of Dr. J. H. Holbrook, of the Mountain Sanatorium, assisted by Dr. C. R. L. Morgan and others. A qualified nurse is in attendance. Four clinics are held a week for adults and school children. If a patient does not respond well to treatment he is invariably sent to the sanatorium. Children with glandular and bronchial infection are carefully watched. Milk tickets are supplied to the poor by the Hamilton Junior Health League, and with money left by the late Miss Doolittle, eggs, fruit, and other dainties can be provided. A dental clinic is held at the Health Centre in addition to those at two of the public schools, which are under the Health Department. Two dentists, one nurse, and an anaesthetist give their services. There is also a Baby Welfare Clinic which has been a great success.

Only 21 cases of typhoid fever were reported, 9 of which were definitely traced to infection outside the city. There was only one death. Chickenpox is represented by 530 cases and smallpox by 14. There were 74 cases of anterior poliomyelitis, of which 5 ended fatally.

Dr. F. G. Banting has recently visited several of the important centres of the United States, including Baltimore, Boston, New York, Detroit, Chicago, and the Mayo Clinic at Rochester, where he delivered scientific addresses before the Academies of Medicine, and other learned bodies, giving them the history of the discovery of Insulin and its application to the treatment of diabetes. It has been recognized everywhere that this piece of research work is of the first order, and that Banting himself is essentially a scientific worker of unusual calibre.

MANITOBA

At the last meeting of the Manitoba Medical Association the following officers were elected, S. J. S. Peirce, Brandon, President; D. A. Stewart, Ninette, Vice-President; F. Lachance, Winnipeg, 2nd Vice-President; N. W. Warner, Winnipeg, Honourary Secretary. *Editorial Board:* Egerton L. Pope, Winnipeg, Chairman; F. C. Bell, Winnipeg, Secretary; William Boyd, A. T. Mathers and James McKenty, Winnipeg.

BRITISH COLUMBIA

We regret to note that a dispute has arisen between the medical officers employed by the C.P.R. Employees' Medical Association, and the latter organization, owing to the excessive amount of work imposed on the medical officers. Many conferences have taken place between the two. According to the statement of the medical officers the Employees' Association have on several occasions agreed to their demands after full discussion, but later on have withdrawn from their new arrangements. The medical officers state that the contract of January, 1922, was of the all-inclusive or blanket type, whereby the doctor was required to give treatment for any and all conditions arising not only in the employee himself but in his family and dependents. The medical officers' committee in their request for a modification of the contract offered to the employee a full service, but requested that all operations on the family and dependents be withdrawn from the contract; these latter however would still receive a service for ordinary sickness and first aid in injuries. The railway officers' committee state that in making this proposal to the Railway Association they are conceding a far more amplified service for the remuneration paid than is given to any similar railway organization in Canada or in the United States. A further concession was also made on behalf of the profession of British Columbia by offering the Railway Employees' Association the privilege of having such operations as had been withdrawn from the contract done under a special agreement with the British Columbia Medical Association at specially reduced prices similar to those of the Workmen's Compensation Board. The answer to this offer has been delayed from time to time until during January an attempt was made by the Employees' Association to deal with some of the medical officers independently and without the knowledge of the Industrial Service committee of the British Columbia Medical Association, who had been authorized to act for them. The Railway Committee then sent a notice to all their medical officers whether involved in the matter at dispute or not, to meet the Railway Employees' Association in Vancouver individually. To this request the medical officers made no response. While these negotiations were going on advertisements were inserted in the Press calling for applications from medical men to fill the positions of the medical officers of Vancouver. The medical officers in presenting this statement to the profession in Canada feel that they have gone as far as they can, and while for the present no one of them is refusing to give his services to any employee requesting such services, it is hoped that any member of the profession elsewhere in Canada will acquaint himself fully with the facts of the situation before accepting any position with the Employees.

The British Columbia Medical Association Executive and Committee have been particularly busy during the past few weeks with various matters of importance. The Industrial Service Committee under the chairmanship of Dr. A. S. Monro, has had a strenuous time in connection with the dispute between the C.P.R. Employees' Medical Association and the British Columbia Medical Association, a detailed report of which will be found in another column.

Dr. E. M. Pearse assumed the position of General Superintendent of the Provincial Royal Jubilee Hospital, Victoria, B.C., on January 1st. The appointment of Dr. Pearse is popular with the local profession and he is assured the good wishes and loyal support of all. The east wing of the new hospital is rapidly approaching completion. This will be the last word in hospital construction and Victoria anticipates with pride its early opening.

The Educational and Publicity Committee (chairman, Dr. W. B. Burnett) is working on the forthcoming "Public Health" Campaign which is expected to be on a larger scale than last year. The weekly "Health" bulletins now appearing in the Victoria and Vancouver papers are apparently much appreciated by the public and it is intended to make them a permanent feature.

A special general meeting of the British Columbia Medical Association will be held on February 12th, when the members will be asked to vote on a resolution eliminating from Railway Medical Contracts all medical and surgical work on the wives and dependents of employees.

Dr. Edward S. Hasell has been forced through ill-health to resign the position of Medical Superintendent of the Provincial Royal Jubilee Hospital, Victoria, B.C.. Dr. Hasell was Superintendent of the Jubilee hospital for a period of twenty years. The local profession wishes him a speedy recovery to health.

Obituary

LAWRENCE BRUCE ROBERTSON, B.A., M.B.

In the death of Dr. Bruce Robertson at the very early age of thirty-seven, in the prime of his manhood and just on the threshold of a career of great promise, the profession has lost a straightforward, honest and brilliant young surgeon, the University an ardent investigator, and enthusiastic teacher, and his colleagues on the Hospital Staff a sincere friend and "genuine good fellow."

Bruce Robertson was born in Toronto in 1885 of Scottish parents. He was educated at Upper Canada College and the University of Toronto, graduating in Arts in 1907. He entered Medicine after his Arts course was completed, and was noted as an earnest and ambitious student, acting as class assistant in Physiology and Pharmacology during the last two years of his undergraduate course. He graduated in 1909 and was appointed interne in the Hospital for Sick Children, receiving one year's training in the surgery of childhood. The next year he successfully competed for a post as interne in the Fourth Surgical Division of Bellevue Hospital, New York City. He served in this capacity for eighteen months, obtaining a valuable experience in general surgery. For a further period of six months he acted as House Surgeon in the Children's Hospital, Boston, and thus rounded out his surgical training.

On his return to Toronto he was offered an appointment as Junior Surgeon to the Hospital for Sick Children, which he filled with great efficiency. In the reorganization of the Staff in 1921 he was made Associate Surgeon, and occupied this post at the time of his death.

With so excellent a foundation for a surgical career, and surrounded by colleagues who were all keen, progressive and argumentative, he was provided with the necessary stimulus for his surgical advance, and at once took his place as an equal, and in many ways a leader, among his confrères. Many of the unsolved problems in the surgery of childhood attracted him, and at an early date he set himself the task of solving some of them. In collaboration with the medical service he did much to advance the surgery of pyloric obstruction in infants, and largely through his efforts the operation of Rammstedt was introduced as the routine treatment of obstructive conditions which required surgical interference. Blood transfusion in marasmic infants and other toxic conditions attracted him soon after his appointment, and although this aspect of his work was interrupted by his war service, his army experiences sent him back to it with a new zest, and he gave it much serious attention. As a result he suggested and brought into operation exsanguination combined with transfusion in selected cases of extreme toxaemias, especially in severe burns. After a great deal of research and experimental work on this subject he perfected the technique so that a greater part of the entire blood of an individual could be withdrawn and new blood from a series of donors substituted. The results were in many cases brilliant, and there is no question that by this method the mortality in severe toxaemias was tremendously lessened. This work alone will perpetuate the memory of Bruce Robertson in the annals of surgery. Much study was devoted also to the subject of empyema in childhood, and he was energetically following a series of cases treated in various ways, in an effort to lessen the mortality and to restore patients suffering from this serious disease to a complete functional cure.

His keen participation in all the surgical activities of hospital, University and medical societies made him generally and favourably known. In his University work he was thorough, and always willing to spend time and effort to make his clinics helpful. He had just enough satire in his speech to make his lessons impressive, and all his students held him in the very highest esteem.

The work he did as an undergraduate laboratory assistant in Physiology and Pharmacology made it easy for him to take up the laboratory work in Pathology which related itself closely to his surgical duties. He was appointed assistant in Pathology in 1914, as well as assistant in Clinical Surgery in the same year, and held the post of demonstrator in Clinical Surgery in the University at the time of his death.

At the outbreak of the War, as a young unmarried man he felt the call of duty for service overseas, and as early as August, 1914, was commissioned as Lieutenant in the C.A.M.C. After a period of several months' duty at Exhibition Camp, when No. 2 C.C.S. was mobilized in February, 1915, Dr. Robertson was taken on the strength of that unit with the rank of Captain. After necessary but none the less irksome delays the unit left Halifax in April, 1915, and on arrival in England Dr. Robertson was attached to Moore Barracks, Shorncliffe, until his unit proceeded to France in September, 1915.

For many months he did excellent service at the base being for some time attached to No. 14 General Hospital at Wimereux. Here very soon after his arrival he was able to demonstrate the value of blood transfusion, and was the means of saving a number of patients who apparently would have succumbed otherwise.

In November, 1916, he rejoined No. 2 C.C.S. at Remy Siding, just behind Poperinghe, as surgical specialist, and in this very active unit he gave of himself unsparingly, with very little leave until January, 1918. The magnitude of the work is imagined when it is noted that 30,000 casualties passed through this C.C.S. in the campaign of 1917, and before the system of team work was established Major Robertson was on duty often sixteen to twenty-four hours at a stretch. Eventually his health gave way under the strain of this work, and he was given leave to London.

Ambulance cases coming direct from the firing line to the C.C.S. presented many opportunities of demonstrating the inestimable value of blood transfusion in severe loss of blood from wounds. Major Robertson had provided his own apparatus and took it with him from Canada, and its life-saving features were so evident that it soon attracted the attention of his superior officers and he was called upon frequently to demonstrate in Canadian and Imperial units the methods employed. There seems no doubt that to Major Robertson belongs the credit of establishing this method of treatment of shock and haemorrhage upon a firm basis in army procedure.

His ingenuity was shown again in the modified gatch frame he devised out of stretchers for maintaining the Fowler position in abdominal and chest wounds, which added wonderfully to the comfort of the wounded, and materially improved their chances of recovery.

On account of continued ill health he was invalided home in February, 1918, but continued on duty in the hospitals in Canada, and was demobilized finally in December, 1920. During the last months of his service in Canada he was detailed by the Militia Department to make models and descriptions of transfusion apparatus and methods of application, for preservation in the Army War Museum at Ottawa.

The life of Dr. Bruce Robertson was such an one as might serve as a pattern for any young surgeon, and at his death a great host rises up to revere his name. He is separated from us in the body, but his spirit will live and his works will remain as a permanent memorial.

Clarence L. Starr

Dr. John Mills died in London on January 29th, in his 68th year.

Dr. Henry T. Knapp, McGill. 1895, died at Sackville, N.B., on January 31st, a graduate of Acadia College in Arts as well as of McGill in Medicine.

Dr. Sydney P. Cooke, McGill. 1869, died at Ottawa on January 30th, considered the Dean of the medical profession in Ottawa, where he had practised for the last fifty years.

Dr. Robert W. Bucke, of Windsor, died suddenly at his residence on January 15th. A graduate of 1906, he was the son of the late Dr. R. Bucke, of London, and had but recently come to Windsor.

Dr. E. L. Burnham, a well-known physician of Millbrook and the district, died there on February 9th, in his eighty-first year. Dr. Burnham was a graduate of the University of Toronto, and was the gold medalist of his year. He first practiced in Hillsburgh, near Guelph, moving to Cannington, and finally to Millbrook, where he had lived for more than forty years.

Dr. Archibald M. McLay, who had been a resident of Woodstock for fifty years died in that city on January 28th, 1923. Born in Glasgow in 1843, he came to Canada in 1854, and lived in the county of Elgin, moving later to Woodstock. As alderman and as a member of the Board of Education he had shown an interest in all local questions. He had served as Medical Officer of Health for years. An ardent Liberal, he had assisted various members of Oxford county in their political campaign. Dr. McLay is survived by his wife and eight children, two of his sons are members of the medical profession, one in Grimsby and one in Woodstock.

Dr. F. C. Campbell, one of Hepworth's early and best known residents died in that village on January 30th. A brother of the late Wilfred Campbell, the well-known Canadian poet, Dr. Campbell was born near Port Dover in 1859. He graduated at the Owen Sound Collegiate, and took his degree in Medicine from Trinity, beginning practice in the county of Peterborough, but later going to Hepworth. Dr. Campbell had served the municipality for many years on the school board and was known in the district as a practitioner of the old school, one ready to offer any assistance at any time, and one whose loss will be much felt in the community.

Sir Thomas George Roddick—As we go to press this 20th inst., the news reaches us of the death in the early morning of Sir Thomas George Roddick, M.D., LL.D., F.R.C.S. Medical men everywhere throughout the Dominion will deeply mourn his passing, for not only did he during his life time take an active part in all efforts tending to the advancement of our profession, but his genial and generous character made him friends in every province. His university, his adopted city and province, and the Canadian profession which he did so much to unify, will receive the news with deep regret. We hope to refer at length in our next issue to the many events in the very notable record he made for himself in his professional career and as a Canadian.

Dr. C. E. Preston, one of the best known of Ottawa's medical men died of pneumonia on February 7th. Only thirty-eight years of age, Dr. Preston will be remembered as a keen worker in orthopaedic surgery and roentgenology and particularly so by those who had the good fortune to be associated with him in No. 1 General Hospital, at Etaples, France, where the excellence of his technique was always in evidence. Well trained at home and abroad, he was a quiet master of his art and one also who brought to the performance of his duties a delightful personality and charm of manner. Dr. Preston was a graduate of McGill in 1904, and L.R.C.P. and S., of Edinburgh, 1906.

Dr. R. H. Scott, one of New Westminster's most prominent physicians, passed away January 23rd., 1913, at the Vancouver General Hospital. He had been in very poor heath for the past two years. Born in Pembroke, Ontario, in 1881, he was educated in the Pembroke schools and graduated in medicine in 1904 from Queen's University. Dr. Scott came to British Columbia in 1907, and was for a time at Phoenix, later removing to Fraser Mills, where he lived until four years ago, when he moved to New Westminster. For the past twelve months he was medical officer for the Canadian Western Lumber Company, Limited, and for several years was Mayor of Maillardville. In 1912 he married a daughter of Samuel Brethour, of Sidney, B.C., who with her three children is living in New Westminster.

The death of **Dr. William Robson Nichols** occurred suddenly from cerebral haemorrhage on December 5th at his residence in Winnipeg. The deceased was born at Markham, Ontario, in 1860, and graduated from Trinity Medical College in 1886. He shortly afterwards took post-graduate work in gynaecology and surgery in New York, and later on went to London, where he became a pupil of Sir R. J. Godlee, and a house surgeon at Guy's Hospital. He obtained his L.R.C.P. in Medicine in 1899, and his F.R.C.S. in Surgery in 1902. He afterwards came out to this country and settled in Winnipeg, where by his untiring labour and brilliant accomplishments he rose to an eminent position in his profession. He was President of the Winnipeg Clinical Society, and was an examiner in Surgery in Manitoba University in 1908. The same year he was chairman of the Surgical Committee of the Dominion Medical Association. In 1913 he was elected a Fellow of the American College of Surgeons, and also a member of the American Association of Gynaecology. He leaves a widow and four daughters, two of whom are married.

Book Reviews

History of the Great War, Based on Official Documents. Medical Services Surgery of the War. Vol, I. Edited by Major-General Sir W. G. Macpherson, K.C.M.G., C.B., LL.D.; Major-General Sir A. A. Bowlby, K.C.B., K.C.M.G., K.C.V.O.; Major-General Sir Cuthbert Wallace, K.C.M.G., C.B., and Colonel Sir Crisp English, K.C.M.G. Octavo, 618 pages. Illustrated. Price, £1 5s. 0d, Net. Printed and Published by His Majesty's Stationery Office, Imperial House, Kingsway, London, W.C. 2, 1922.

"The unparalleled number of battle casualties which occurred during the war gave consulting and specialist surgeons an unrivalled opportunity for surgical work, and as the years went on the improvement in methods, and the skill acquired in dealing with wounds, placed war surgery in a position which it had never occupied in the past.

"The account of this work, recorded in the two volumes of the Surgery of the War, has been prepared by the Consulting Surgeons and by some of the surgical specialists who held commissions in the Royal Army Medical Corps."

The eighteen chapters include a reference to the various problems of Military Surgery from Projectiles and their action. Wound Shock, Blood Transfusion, Gas Gangrene, Tetanus, Trench Foot, Injuries of the Chest, Pericardium and Heart, to Wounds of the Abdominal Viscera, and also refer to the varieties of work encountered in Field Ambulances, Casualty Clearing Stations and Base Hospitals both on the Western Front and in the United Kingdom, as well as to work in Palestine, Mesopotamia and Macedonia.

It will be obvious that in a monumental work of this character there is much that is of a highly technical nature from the viewpoint of the Military Surgeon, but there is also much that is properly applicable to the civil surgery of the present day. The chapters dealing with Shock, Blood Transfusion and Tetanus, and the extended references to the Wounds of various portions of the body should be of extreme value to every surgeon, particularly since the object of the work is to describe only those methods which at the end of the war had been found to be the most trustworthy.

It is with extreme pleasure that one notes the extended reference to and appreciation of the work done in the development of blood transfusion by Dr. Bruce Robertson.

The volume is well printed, carefully edited and beautifully illustrated, and will be a valuable addition to the library of every active surgeon. E. R. S.

Diseases of the Heart. By John Cowan, D.Sc., M.D., Glasgow, and W. T. Ritchie, O.B.E., M.D., Edinburgh, with a chapter on the Ocular Manifestations of Arterial Disease, by Arthur T. Ballantyne, M.D. Second edition, p. xvi 605, demy 8vo. with 32 illustrations and tracings. Price, 30s. net. London, Edward Arnold & Co., 1922.

The first edition of this work appeared in 1914. During the eight years which have elapsed much has been added to our knowledge of the heart in health and disease. The study of heart murmurs and of cardiac efficiency has been an important clinical research during the war, and the results of strain and infective disease have been carefully investigated. It has been shown that not only acute infections but chronic focal infections play an important part in endocardial and myocardial changes. The authors have had special opportunities to study cardiac conditions both in active war hospitals and in their work for the Ministry of Pensions. As a result, many of the chapters in the previous editions have been revised and a number of chapters have been added. The work is a comprehensive presentation of our present knowledge of diagnosis, prognosis, and treatment of heart and arterial disease with chapters upon the anatomy and physiology of the circulatory organs. Ritchie in numerous journal articles has made valuable contributions to the literature of cardiac disease, and the present volume though of necessity making frequent reference to the work of other authors, is to a great extent a record of personal observation and opinion based upon wide practice and the attentive study of much clinical and pathological material. A book based upon intimate personal study of cases must always recommend itself to its reader, and this work is no exception Clear, concise, comprehensive, it should appeal to a wide circle and it is heartily recommended to every practitioner.

Under prognosis in auricular fibrillation, mention is made of one patient who had persistent fibrillation for at least three years before his death, another whose auricles were in fibrillation for at least nine years before he died, and for six of those years he worked at the pithead. A physician, aged eighty-five, has had auricular fibrillation for six years though he remained on duty during the war. The cases which are associated with mitral stenosis seem to have a better prognosis than those which are due to other cardiac lesions. In a general way the inception of permanent fibrillation is the beginning of the end, though many patients are able to lead quiet lives for a year or two after the onset. The immediate prognosis depends chiefly on the rate of ventricular contraction, the presence or absence of ventricular dilatation, and the response to the administration of digitalis. The prognosis is relatively favourable if the pulse rate, with or without drugs, can be kept within normal limits. The prognosis is always grave if ventricular extrasystoles are superadded, and these patients will probably die within two years at the latest.

The author's opinion of the value of quinidine sulphate is summed up in a short paragraph. "In the most favourable cases the arrest of the fibrillation is only transient. The normal rhythm is seldom maintained for longer than a few hours or days, and the general condition of the patient is but little, if at all, benefitted. In exceptional cases the normal rhythm has been maintained for several months by intermittent administration of quinidine. On the whole quinidine seems to be of little therapeutic value; in efficacy it cannot be compared to digitalis."

J. H. E.

Gonorrhoea and Impotence—Modern Treatment. By Edwin W. Hirsch, S.B., M.D., American Electrotherapeutic Association, 1st. Lieut. M.C., U.S. Army. With an additional Lecture on Ultra-Violet Radiation by A. J. Pacine, M.D. 172 pages, with illustrations. The Solar Press, 209 S. State St., Chicago, Ill., 1922.

Frankly one can find little in this small volume to commend it to the average practitioner. The preface states that, "The average doctor after graduating goes forth from medical college with hazy and indefinite ideas of the most important of human affections, venereal diseases." If this be so one cannot see that this work will enlighten him to any great extent. Apparently the author believes that the most important agents in the treatment of all subacute and chronic gonorrhoeal infections and their complications are Diathermy, Radiant Heat and Ultra-Violet Radiations.

The text is sadly in need of proper proof reading as this quotation may attest: "The average case of Gonorrhoea in women however, is ambulatory and the office treatment is the principal one. Nothing compares with Ultra-Violet Radiation in the treatment of Gonorrhoea for it relieves the infection by killing the HOST."

One can only observe that the average host does not want to be killed. E. R. S.

Vitamines and the Choice of Food. By V. G. Plimmer and R. H. A. Plimmer, D.Sc. Octvo. xii. 164. Numerous plates and cuts. Price, $2.50. Longman Green & Company, London, Toronto, 1922.

This excellent book cannot be too highly recommended to the general practitioner or intelligent laymen. It is well written, thoughtful, unbiassed and constructive. The last two chapters alone, "Effect of partial deficiencies in the food" and "Errors in the selection of the food" will be valuable to many a practicing physician who finds difficulty in advising his patients in matters of diet. Vitamins have become such a popular subject of discussion that no physician should be ignorant of what they are and their importance. This book will fill his wants and yet prove not difficult reading. The publisher is to be congratulated on having printed a book by an eminent expert couched in simple language, suitably and well illustrated and well printed. V. E. H.

Physiology for Dental Students. By A. G. Curzon-Miller, B.Sc., L.M., S.S.A., F.C.S. Octvo. viii, 266. Price, 15s. Edward Arnold, London, 1922.

This book can be strongly recommended to the physician as a readable and well written account of physiology in its widest sense. Necessarily it is somewhat limited in its scope and pays more attention to the mouth and to digestion than the ordinary text-book, but in spite of this it is a good all round book. The development of the mouth parts is treated adequately from the point of embryology and were our dentists as well trained in physiology as this book postulates, they would be useful confrères of the physician. V. E. H.

Practical Physiology. By E. P. Cathcart, M.D., D.Sc., F.R.S., D. Noel Paton, M.D., LL.D., F.R.S., and M. S. Pembrey, M.A., M.D., F.R.S. Octvo, xii. 344 pages. Numerous cuts. Price, 18s. Edward Arnold & Co., London, 1922.

This is a well printed and bound book, written by three distinguished Englishmen all of whom have previously published separate books of a similar character. It is entirely a laboratory manual with excellent exercises carefully compiled by experienced teachers and splendidly illustrated. As it is not intended for the physician, an extensive review in this place is not indicated but it is a most valuable book for the laboratory worker. The handicap under which the research worker and teacher of physiology in Great Britain suffers, owing to the antivivisection laws, is plainly manifested and is another evidence that supremacy in such work and in the understanding of health and disease must pass to America, where as yet there is more freedom. The profession in Canada must prevent if possible this handicap being imposed on work here. V. E. H.

The Writing of Medical Papers. By Maud H. Mellish, Editor of the Mayo Clinic Publications. 12mo. of 157 pages. Cloth, $1.50 net. Philadelphia and London: W. B. Saunders Company. Toronto: The J. F. Hartz Co., 1922.

Mrs. Mellish has presented in attractive and readable form a handbook for the guidance of those who do not possess the art of writing. Were writers of medical papers and essays to follow its directions and suggestions, the editors and proofreaders would find much time on their hands and much more pleasure in the hours devoted to their work. Editors have frequently drawn attention to the lack of care exercised by medical contributors in the preparation of their articles for publication. Careless punctuation, wrong use of capitals, inattention to paragraphing, lack of uniformity in recording the references, violations of good usage, carelessness in use of abbreviations, irrelevant title, incorrect English, failure to build the paper on a complete outline, and lack of careful revision are some of the faults most frequently noted by medical editors. Careful reading with occasional reference to this small work should lessen the errors found in scientific papers. The work too is in such form as to be of assistance in creating more uniformity in medical journalism. In an attempt to define what is proper and what is not accepted as pure English there is not infrequently a difference of opinion but those who follow Mrs. Mellish's guidance will not go far astray. Here and there a slip is to be found. For example, Manit. is given as the proper abbreviation for Manitoba. No fault can be found with the abbreviation Alta. for Alberta, though it is generally understood that the provincial authorities prefer that the name be spelled in full. There is appended a short list of books and articles which have appeared on the theory and practice of the writing of scientific articles. J. H. E.

Practical Chemical Physiology. By W. W. Taylor, M.A., B.Sc. Pp. 68. Price, 4s. 6d. net. Edward Arnold & Co., 1922.

It contains the experiments performed in practical biochemistry by the medical students at the University of Edinburgh and includes rather less qualitative and more quantitative work than is usual in such courses. There is no discussion either of theoretical or practical considerations. H. W.

A Laboratory Handbook of Biochemistry. By P. C. Raiment, B.A., M.R.C.S., and G. L. Peskett, B.A. Pp. 100. Price, 5s. net. London: Edward Arnold and Company, 1922.

This little book contains an excellent series of laboratory exercises appropriately arranged for use as a course for medical students. The experiments cover all the important properties of the various biochemical substances. They are clearly and concisely described and in those cases where complications often arise, are accompanied by excellent explanatory notes. The author has also included in each section a short theoretical discussion of the subject sufficient in scope to be distinctly helpful to the student in need of orientation, but so condensed that his time in the laboratory will not be unduly diverted from practical work. H. W.

Generalized Pain. By Prof. Dr. Norbert Ortner, Vienna. Translated by Francis J. Rebman, being Part II of Ortner's Clinical Symptomatology of Internal Diseases. Pp. xiii, 596, 8vo. New York: Medical Art Agency. No date.

Part I, dealing with abdominal pain, was received so well that the author followed with this volume which is now translated soon after its appearance in its second German edition. Dr. Edgar in his short introduction states that it represents a complete symptomatology of all the painful sensations experienced by the human organism with the exception of the abdominal region. *Generalized Pain* does not properly express the scope of the work which deals with pain other than abdominal. We cannot agree with the translator's statement that it is appropriate. The introduction too, states that "The translator has chosen clear and simple English, making the book easier to digest and more readily assimilated." With this statement in mind one reads on page 99, "During the menstrual period complaints of sacral pain are ripe, especially in pregnant women, primarily due to the menstrual molimena." Clear simple English indeed! On page 94 we read "A uterine carcinoma may be the causating element." On page 197 reference is made to a "peripheritic abscess;" on page 64 among English words "volumen pulmonum auctum." On page 437 "congital" is probably in error for congenital as is "rachitic" for rachitic, if not, these words are beyond our ken. But why on the same page the translator should use the Greek form parotis when speaking of the parotid gland we cannot understand. No strong objection can be raised when the translator uses the term tendovaginitis instead of the more usual tenosynovitis, but we are not accustomed to the adjectives motoric and vasomotoric. Hyperthesia on page 311 is another unusual word. We read of a rupture of the heart, of the bursting of an aneurysm and the bursting of a bronchial gland. There are so many changes in terminology that when one reads on one page of "dry pleuritis" one wonders whether pleurisy sicca might not be found on reading further. Mitral ostium is a similar combination of Latin and English frequently found. Repetition is avoided by referring to the innominate artery as the anonymous artery and elsewhere as the anonyma artery or simply as the anonyma. The use of the word motation is also perhaps an attempt to introduce variety. Ortner's writings are usually good. This may be good in the original. The chapter headings indicate an attempt at excellent classification, and there is a mass of material in the volume. The translator has given us, instead of clear lucid statements, readily assimilated, a mass of confused terms, requiring more study than is warranted in attempting to get a clear picture of the subject. The book abounds in misprints throughout. J. H. E.

Manual of Gynecology. By John Osborn Polak, M.Sc., M.D., F.A.C.S. Second Edition, revised. 378 pages with 139 engravings and 10 coloured plates. Price, $4.50. Lea & Febiger, New York and Philadelphia, 1922.

In this book of somewhat less than four hundred pages the author has attempted to cover the essential details of a complete study, from a general point of view, of the subject of Gynaecology. That his efforts have been attended by a large measure of success is undeniable. By making his statements "snappy" he has eliminated about half of the pages that are usually found in a book on gynaecology and that, too, without much loss of value. The illustrations are apt and sufficient in number for the purpose of such a book. Elimination of the nude diagram of the Sims' position on page 38 would not detract from its value. Little purpose is served by the diagram of the knee-chest posture on page 39 and it is not attractive. The inclusion of the haemorrhage charts is a good feature as an intensive study of these is of great value as suggesting differential diagnosis in cases in which haemorrhage is a noted symptom. On page 46 the author states, "The right hand should be used in examining the right side of the pelvis, while the left hand has greater facility in determining the contents of the left side." To change hands during an examination is an unnecessary, disagreeable practice which should be avoided unless under exceptional circumstances. The explanation of the menorrhagia from fibroids as given curtly at page 263-4 is not likely to satisfy the gynaecologist who recognizes the function of the uterine muscle in the control of the intimate circulation of the uterus. On the whole this book should prove useful to students and general practitioners, as it is essentially practical. F. W. M.

The Art of Anaesthesia. By Paluel J. Flagg, M.D. Third Edition, revised. 371 pages with 136 illustrations. Price, $4.50. Published by J. B. Lippincott Co.

In this volume, Dr. Flagg has brought to our attention an instrument which he has devised, viz., the Haemoxometer, for the clinical measurement of cyanosis. This is entirely new and worthy of note, although whether it will be of any practical value remains to be seen. It is probable that many anaesthetists will disagree with some of the author's views: for instance, in his citing of the advantages of using the open drop method, where he says this method is fool proof, whereas one should hesitate to make the statement that any method is fool proof. Then again the author states that there are certain subjects who cannot be controlled by this method, which has not been the experience of many good anaesthetists. To those who have read the former editions of this work, the mastery of detail that Dr. Flagg has shown, will be familiar. This book gives a great deal of valuable information, and every anaesthetist should have it in his library. S. J.

International Clinics. Thirty second series, volume iv, 1922. Edited by H. R. M. Landis, M.D., Philadelphia, with medical and surgical collaborators in United States, England and Canada. Price, $2.50 per volume, or $10.00 for the series of four. J. B. Lippincott Company, Montreal.

The final volume of the 1922 series contains twenty-seven articles grouped under the headings, medical welfare work, nutritional problems, clinical medicine, pediatrics and clinical surgery. The papers are by American writers with the exception of three. J. W. Ballantyne writes most interestingly of the work of the Antenatal and V.D. Clinics at the Edinburgh Royal Maternity Hospital, Sir Humphrey Rolleston gives a splendid resumé of medical aspects of gall bladder disease and Labbé and Bith of Paris, discuss acidosis. Sterling Mead, of Washington, D.C., has an illustrated paper on diagnosis of oral sepsis with over one hundred and twenty-five roentgenograms, a companion paper to the one appearing in the last number of the *Clinics*. Major Hitchens lecture on diphtheria, with administration of antitoxin, the Schick test, and the management of epidemics is a most excellent one and covers fully the therapy of the disease. He points out that the deaths from diphtheria in the United States, formerly 80,000 annually have fallen through the use of antitoxin to 20,000, and believes that by use of the Schick test and administration of toxin-antitoxin many of these 20,000 would be saved. John M. Swan and his collaborators deduce from their clinical study of a series of patients with diastolic heart murmurs, that all diastolic murmurs are organic. The study has been a thorough one and the paper is well illustrated. This volume completes the 1922 series, a series which is a credit to the editors and contributors alike. J. H. E.

Pulmonary Tuberculosis. By Maurice Fishberg, M.D., New York. Large, 8vo., pp. 891, 129 engravings, 28 plates. Third edition. Price, $8.50. New York, Lea & Febiger, 1922.

That two former editions were exhausted in five years bespeaks the popularity of this work. Every physician in general practice has to deal with cases of pulmonary tuberculosis and should not consider his duty at an end when he makes a diagnosis and advises sanatorium treatment. There is not sanatorium accommodation for all our cases, so that a large number must, perforce, be treated at home. Nor can many patients remain at a sanatorium until treatment is completed. They must continue treatment at home. How to care for the tuberculous patient must be adequately understood by the general practitioner, and few text-books on clinical medicine cover the ground fully. A monograph such as this should find a place in the library of every physician. The physician will learn that given proper facilities for treatment and with cooperation from the other members of the family, the patient may be treated effectively at home, and that by careful attention to details he may look for the same immediate and ultimate results as in institutional treatment. If a period of sanatorium treatment can be secured for the patient, the physician will then find it much easier to carry on treatment at home. Prevention of infection of others is an important part of the treatment. The author points out clearly the lessons learned from experimental work with animals and from our knowledge of the extent of tuberculous infection in children. Children are to be protected from infection, but as most adults have tuberculous infection (to be distinguished from disease) they require protection not so much from the patient as from those conditions which tend to cause extension or activity of the infection already present—that is to avoid changing the infection with its degree of immunity, into active disease.

Many of the chapters have been revised in this new edition and new material added. Two new chapters have been added. One is on the medico-legal and insurance aspects of tuberculosis, the other on the reciprocal relations between pulmonary tuberculosis and certain physiological and pathological processes such as growth, puberty, sexual functions, pregnancy, etc. Consideration is also given to the presence of co-existing conditions such as tuberculosis in other organs, non-tuberculous diseases of the upper and lower respiratory tract, endocrine disturbances, the exanthemata and other infectious diseases, etc. The reader is reminded that in the chronic forms of pulmonary tuberculosis the patient may live for many years and during this period may suffer from almost any other disease to which man is subject. The reciprocal relations of the tuberculosis and other disease is presented from the author's viewpoint.

There is still much to learn regarding infection, epidemiology, predisposition, methods of entrance of the bacillus and the problems of immunity. Fishberg has his own strong opinions regarding many of these problems and present day theories which undertake to explain them. He gives a fair presentation of the views of others so that these chapters will give the reader a good conception of the working theories of the day with the experimental and clinical evidence upon which they are based.

The general management of the case with chapters upon rest and exercise, open air treatment, and climatic treatment is fully discussed. The value of medication receives careful attention, both in the treatment of the disease itself and in the treatment of various symptoms and of complications which may arise. The author is not enthusiastic about tuberculin. He quotes the opinions of many physicians of prominence who believe in its efficiency, but is unable to substantiate their belief from his own observations in practice.

There is a good chapter on the induction of pneumothorax which has proven a valuable method of treatment—one of the most valuable procedures we have at our disposal, but unfortunately one which can be successfully induced only in a small proportion of cases. The chapter on climatic treatment will make clear to the reader the value of change of environment and discusses impartially the advantages of treatment away from home, in desert, mountain, and seaside resorts. J. H. E.

Aids to Public Health. By W. G. Aitchison Robertson, Pp. 160. London: Baillere, Tindall & Cox, 1923.

This little book purports, in the preface, to be a student's refresher, and to contain the main facts of public health, for the assistance of those preparing for examinations in that subject.

It has the usual faults of British publications on

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Public Health, extreme condensation, dogmatism, limited applicability, and is not up to date. General principles of universal use are not much dealt with. In detail, the work on ventilation might have been written twenty years ago. Leonard Hill's classical reports, issued by the British Government itself, do not exist for this author. Typhoid fever "it is said" may come directly from cows through cows' milk. The clinical differences between bovine and human tuberculosis are negligible!

In general, one would hesitate to rely upon the information contained for refreshing the memory; or even for cramming, if one intended to take an examination from modern examiners. It is too superficial and condensed for the beginner; and not bad enough to afford much entertainment for the critic. It therefore fails to fill any long-felt want in any direction within this reviewer's purview.

H. W. H.

Books Received

The Diagnosis and Treatment of Heart Disease. By E. M. Brockbank, M.D., F.R.C.P. Fifth Edition; 232 pages with 25 illustrations and 3 plates. Price, 6s. 6d. net. Published by H. K. Lewis & Co., Ltd., 28 Gower Place, London, W.C.1.

Aids to Public Health. By W. G. Aitchison Robertson M.D., D.Sc., F.R.C.P.E. 160 pages. Price, 3s. 6d. net. Published by Bailliere, Tindall & Cox, 8 Henrietta St., Covent Garden, London.

Carriers in Infectious Diseases.—A manual on the importance, pathology, diagnosis and treatment of human carriers. By Henry J. Nichols, M.D., M.A., with a section on Carriers in Veterinary Medicine, by R. A. Kelser, D.V.M., M.A. Published by Williams & Wilkins Company, Baltimore, Md., 1922.

The Prescriber—January 1923. Published at "The Prescriber" offices, 6 South Charlotte St., Edinburgh.

Mistakes and Accidents of Surgery. By Harold Burrows, C.B.E., M.B., B.S., F.R.C.S. 464 pages. Price, 10s. 6d. Published by Bailliere, Tindall & Cox, 8 Henrietta St., Covent Garden, London.

General and Professional Biology, with special reference to Man. By Edward J. Menge, Ph.D. 886 pages, illustrated. Price, $6.50. Published by The Bruce Publishing Company, Milwaukee, Wisconsin.

How we Resist Disease—An introduction to Immunity. By Jean Broadhurst, Ph.D. 234 pages with 138 illustrations and 4 colour plates. Price, $2.50. Published by J. B. Lippincott Co., 201 Unity Building, Montreal.

Physics and Chemistry for Nurses. By A. R. Bliss, A.M., Phm.D., M.D., and A. H. Olive, A.M., Ph.Ch., Phm.D. 170 pages with 70 illustrations. Price, $2.50. Published by J. B. Lippincott Co., 201 Unity Bldg., Montreal.

Essentials of Surgery. A textbook of surgery for student and graduate nurses and for those interested in the care of the sick. 247 pages, with 49 illustrations Second edition, revised. Price, $2.50. Published by J. B. Lippincott Co., 201 Unity Bldg., Montreal.

Nutrition of Mother and Child. By C. Ulysses Moore, M.D., M.Sc., including menus and recipes by Myrtle J. Ferguson, B.S. 227 pages with 33 illustrations. Price, $2.00. Published by J. B. Lippincott Co., 201 Unity Bldg., Montreal.

I Believe in God and in Evolution. By William W. Keen, M.D. Second edition. 102 pages. Price, $1.00. Published by J. B. Lippincott, 201 Unity Building, Montreal.

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PRELIMINARY PROGRAMME

TUESDAY

Registration; discussions on "Infections of the Hand." and "Injuries of the Hand and Forearm;" official luncheon at 12 noon; in the afternoon a paper by W. J. Mayo, "Septic Factors in the Great Plagues;" Orthopaedic Clinic on selected illustrative cases by Sir Robert Jones, of Liverpool, and lantern slide demonstration on "Acute Osteomyelitis" by Edward Gallie, Toronto. In the evening Sir Berkeley Moynihan's address as noted above.

All the sessions of opening day will be held in the Mount Royal Hotel.

WEDNESDAY

On the second day (Wednesday) the afternoon general session will be given up to papers, "Intestinal Obstruction," Sir William Taylor, Dublin; Symposium, Recent advances in the treatment of organic disease; Nephritis; Myocarditis; Pleural Infections; Diabetes and the Prostate.

In the evening the official banquet.

THURSDAY AFTERNOON GENERAL SESSION

SYMPOSIUM

"The Problem of More and Better Children."

1.—Sterility of the Female,
    (a) Relative,
        Displacements.
        Uncured Venereal disease.
        Birth trauma—abortion or labour.
        Endocrine disorders.
    (b) Absolute,
        Anatomic changes the result of disease or of improper treatment.
        Curettage.
        Radiation.
2.—Sterility of the Male,
        Uncured Venereal disease.
3.—Prenatal care of the Mother.
4.—Conservatism in delivery—from the standpoint of
    (a) Mother. (b) Child.
5.—Care of the New Born,
    (a) Hereditary Syphilis.
    (b) The Child's Food.

The subject will be presented by the gynaecologist, obstetrician, urologist, internist and paediatrist, and will be of peculiar interest not only from a medical standpoint but because of its national importance in its relation to increase of population by natural growth as against immigration.

The Canadian Radiological Association has joined forces with the C.M.A. and will hold its meetings as a section of the latter. The radiologists will participate in the hospital sectional clinics, and will also have sessions in the Mount Royal Hotel.

The Canadian Society of Anaesthetists presents a programme which is complete almost to the final detail, but lack of space forbids its publication in this issue.

In the next issue of the *Journal* will be published a complete preliminary programme.

Invitation is herewith extended to members who desire to contribute to the programme to notify the Chairman of the Programme Committee without delay and effort will be made to provide a place for them.

RAILWAY TRANSPORTATION ARRANGEMENTS

Visitors to the meeting are advised as follows:—

The ordinary convention certificate rates of one fare and a half will be issued to all members of the association coming from points east of Port Arthur. The date of departure will commence on the 7th June and the tickets will be good for return up till midnight of the 20th June.

To those coming from points west of Port Arthur an extension of time will be afforded. Attention is drawn, however, to the fact that for all members coming from the far west, it will be more profitable to purchase a "Tourist's" Ticket, inasmuch as the rates are cheaper than those issued on the certificate plan.

The Railway Authorities suggest that intending visitors should in any case consult the local agent with reference to this alternative.

OFFICERS AND LOCAL ORGANIZING COMMITTEES

Dr. C. F. Martin, *President*

President

Joint Local Secretaries

F. J. Tees, 105 Crescent Street, Montreal; J. U. Gariepy, 80 St. Denis Street, Montreal.

General Executive Committee

Chairmen—C. F. Martin and L. deL. Harwood. Members—S. G. Grondin, W. G. Reilly, Z. Rheaume, Eugene St. Jacques, George Hall, A. T. Bazin, B. G. Bourgeois, R. Masson.

Registration Committee

Chairmen—Wm. Bauld and E. Trottier. Members—J. U. Gariepy, D. MacCallum.

Reception Committee

Chairmen—J. Alex. Hutchison and Rodolphe Boulet. Members—G. E. Armstrong, H. S. Birkett, E. P. Benoit, A. J. Lesage.

Entertainment Committee

Chairmen—J. R. Fraser and J. P. Decarie. Members—C. A. Peters, Graham Ross, J. W. Duncan, J. G. Johnson, L. T. Parizeau, C. F. Wylde, E. H. White, F. Gurd.

Railway and Transportation Committee

Chairman—George Hall. Members—W. Grant Stewart, J. R. Byers, G. A. Fleet, H. B. Carmichael, G. C. Anderson.

Ladies' Committee

Chairmen—F. G. Finley and L. deL. Harwood. Members—Eugene St. Jacques, B. G. Bourgeois, H. S. Shaw.

Ladies' Executive Committee

Mrs. F. G. Finley (Convenor), Mrs. E. St. Jacques, Mrs. Bazin, Mrs. R. Masson, Mrs. Martin, Mrs. Bourgeois, Mrs. Fraser.

Exhibits and Finance Committee

Chairmen—W. A. Dorion, 164 Drummond St., Montreal, and H. Aubry, 353 Sherbrooke St. E., Montreal. Members—A. M. Forbes, H. L. Pavey, J. N. Roy, E. J. Mullally.

Hotels and Accommodation Committee

Chairmen—W. G. Reilly and D. Masson. Members—W. H. Reilly, Wesley Bourne.

Programme and Printing Committee

Chairmen—A. T. Bazin, 583 Dorchester St. W., Montreal and E. St. Jacques, 29 Sherbrooke St. W., Montreal. Members—E. Latreille, E. P. Benoit, R. Masson, H. M. Little, A. M. Forbes, W. F. Hamilton, A. H. Gordon, Hon. J. J. Guerin.

Hospital Sections

Hopital Notre Dame—B. G. Bourgeois.
Hopital St. Justine—A. Ferron.
Royal Victoria Hospital—E. W. Archibald.
Hotel Dieu—Z. Rheaume.
Montreal General Hospital—F. M. Eberts.
Montreal Maternity Hospital—H. C. Burgess.
Hopital de la Misericorde—Rene de Cotret.
Children's Memorial Hospital—L. J. Rhea.
Section of Eye, Ear, Nose and Throat—H. S. Birkett.

THE AIMS, AMBITIONS AND ACTIVITIES OF THE ONTARIO MEDICAL ASSOCIATION*

E. R. Secord, M.D., C.M., F.A.C.S., President

Brantford

IN an endeavour to sketch briefly for your information the activities of the Ontario Medical Association, it has seemed that the desired result could most easily be achieved by considering in turn the work of the various committees, each with its special problem, and by relating to you how the work is being carried on.

The committee on Public Health is essentially a sub-committee of our Association. Dr. J. W. S. McCullough is the chief officer of the Provincial Board of Health, so that this committee is in a sense a channel of communication between the two organizations. The Provincial Board of Health has been very active in recent years in the work of prevention, early detection, and alleviation of disease, and this work has achieved good results. In 1910 the mortality rate from typhoid was 51.3 per 100,000 of the population. Today it is 4.3. Among the most valuable facilities which the Provincial Board of Health places at the disposal of the profession, are District Public Health Laboratories. Two additional ones were established last year, one at Owen Sound and one at Peterborough. The work of the laboratories might well be further extended with little additional expense to include the microscopical examination of sections from neoplasms. If this want were expressed by a number of district medical societies surely we would succeed in persuading the Board to grant their request.

The Provincial Board of Health has established fifteen government clinics for the free treatment of venereal disease. This work is very essential, especially amongst the poor who cannot afford to pay for the long-continued course of treatment. We must see to it that certain safeguards are established to prevent the clinic competing unfairly with the private physician by caring for patients who are able to pay, and we must prevent the exploitation of our profession by unfair sentimental appeals to our generosity. Individual well-meaning lay bodies, and societies are too prone to assume that the medical profession or its individual members can afford to work for nothing, simply because the end in view, namely, the prevention of disease, is a laudable one. I would be the last one to advocate a commercial spirit in the profession; on the other hand I do feel that the tendency to organized exploitation of our ranks should be held under control.

In this province there is no adequate definition recognized by law, of the phrase, "practice of medicine." A committee on legislation has been in existence for some years, and more recently a Joint Advisory Committee, comprising representatives of the Council of the Universities and of the Ontario Medical Association, has been formed to obtain such legislation. So far the Legislative has not validated a definition which has satisfied the committee and the profession at large. The combined influence of all the irregular cults with which this province is overrun is great. I wish to stress the attitude that we as members of the profession are taking on all occasions and at every opportunity. We are not asking for protection for ourselves but protection for the public whom we serve. Our contention that, "Diagnosis is the prerequisite of proper treatment," should be spread broadcast. A diagnosis cannot be made without proper education in anatomy and physiology and a knowledge of the signs and symptoms of various diseases. If everyone seeking to attend the sick be forced to acquire a proper preliminary scientific education little need be feared from personal differences of opinion as to the best methods of treatment. It is an anomalous and intolerable situation that a high standard should be demanded of those seeking to practise medicine according to recognized methods and means, whilst any one without previous education can prey upon the public by merely hanging out his shingle and advertising himself as a "Doctor of Chiropractic."

Your Board of Directors acting with the advice of your Committee on Education has sent out, during the past year, two hundred and thirty-one lecturers on medical and allied subjects to the various county and district societies, paying the expenses of a large number. This is a splendid work and I doubt if there is another country in the world where such a real effort has been made to provide post-graduate education within the profession itself. That the undertaking is of real merit is shown by the grant of financial assistance from the advisory board of the Ontario branch of the Canadian Red Cross Society. The reading of papers and exhibition of methods by imported talent at these district society meetings is very valuable, but the greatest stimulus to any man's cerebration is the preparation of a paper himself. At every meeting there should be at least one paper for which a local man is responsible.

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*Abstract of Addresses delivered at various District Medical Meetings in Ontario during the past six months.

The operations and decisions of the Workmen's Compensation Board and the Board of License Commissioners have been the subject of severe criticism on the part of the Association and have given cause for considerable newspaper controversy. That they are both autocratic to a degree is without question; that they may be lacking in tact is possible; but it must be remembered that these boards are appointed to carry out the law, and it would appear that many of the difficulties that have arisen have been due to a lack of sympathy with the law itself rather than to fault of the members of the board in their attempts to carry out their duties. When questions affecting any of the members have arisen, we have been able to secure the appointment of an advisory committee to confer with the members. This is a valuable concession and one which has already served to remove much irritation. These committees, however, are in every case advisory only and the duty of carrying out various provisions of the law still rests entirely in the hands of the individual board concerned. I stress this point because it would be unfair to ask any of your members to act on these committees if they were to be held responsible by the profession for any acts of the board.

I am very happy to be able to tell you that arrangements have been completed whereby, under certain regulations, it is now possible for any member of our Association to borrow any book or medical journal that he desires. On the payment of carrying charges only, such books can be obtained from the four medical libraries of the Province, Queen's University, The Western University, Toronto University and from The Academy of Medicine in Toronto. It is hoped that this arrangement will be appreciated by the members of the Association scattered all over the Province.

Whatever our attitude may be towards hospital standardization as initiated by the American College of Surgeons, we must all feel that there is a minimum standard below which a hospital cannot be considered to be first-class. It is a matter for regret that Ontario, in many ways the banner Province of the Dominion, should bring up the rear with only 36.3 per cent. of standard hospitals; only one state in the Union, namely, North Carolina, is farther behind. It is not in respect of equipment, or of nursing, or of proper laboratory facilities that the Ontario hospitals are defective. It is simply that the great majority of our institutions keep no proper case records. The essential purpose of a hospital is the care of the sick. How can such an institution function properly when no records are kept of the diagnosis, physical findings, laboratory findings, treatment, and the results of treatment of its patients? We do not even know in these hospitals what is the rate of mortality from acute appendicitis, or in what proportion of primarily clean wounds there is postoperative infection. The excuse is that there is lack of time to keep proper case records, but time must be made. From time to time we have cases for which, if we had definite records, a further operation would be quite unnecessary.

One of the most difficult problems in hospital administration in an open hospital is to deal with the incompetent surgeon who does not recognize his own incompetence. In a standard hospital such problems would readily be solved by staff meetings at which case records are reviewed. For the staff would see to it for their own protection that the incompetent man was prevented from operating.

The Committee on the Inter-Relations of the Medical Profession and the Public was formed for the purpose of actively studying a number of important questions, and it was called into being more particularly to study the demand for "State Medicine," so-called, which a short time ago was a plank in the platform of the Independent Labour Party. No concrete conclusions have been reached but let me say that no form of "State Medicine" has yet been proposed which could cope at all effectually with medical conditions in our community, where the population is so much more widely distributed than in

England. It is advisable that this committee should continue its studies and gather all available data in order that the Association may be in a position to thoroughly and effectually control our destinies and prevent some uninformed member of the local House from introducing freak legislation on this subject. This Committee has undertaken to find out how much unattended sickness there is in the Province at the present time.

At our annual meeting in May, forty County and District Medical Societies were affiliated with the Ontario Medical Association. There are about 3,500 licensed practitioners in the Province, of whom perhaps 2,800 are actively engaged in professional work. We have to-day a membership of 1,900 of whom 1,536 are fully paid up for the year 1922. The total paid up membership in 1921 was 1,671. The annual fee has been raised to $10.00 and is smaller than the fee demanded in most of the provinces. It is infinitesimal when compared with the toll exacted from their members for organization and propaganda work by the various groups of irregular practitioners with whom our Province is overrun. Organization on our part is necessary if we are to exert our full influence in legislation. It seems peculiarly true of doctors as is also true of other groups of citizens that a small percentage among them refuse to join with their confrères in any movement for the advancement of the common weal. It may be that our work is of a peculiarly personal kind, that when we have succeeded in building up a practice, we have also constructed a form of mind like that of the feudal lord of old who jealously guarded his lands and his serfs from encroachment from without. It is perhaps idealistic to hope that we will ever have a 100% fully organized profession. We should at least have 2,500 members, and this is the objective we have set before us.

PROBLEMS OF COUNTRY PRACTICE IN NEW BRUNSWICK*

A. B. Walter, M.D.

Cambridge, N.B.

I COME before you to-day as an importation from the West and a comparative stranger, and my observations arise from the point of view to some extent of an outsider. And the picture I am wording has deliberately been made a local one, to be the more concrete; yet I think it may have points of more general application.

Two years and a half ago, on my return from Khakiland, I found myself, by an eccentric chance, locating to work in what must be as purely country as any part in this province, the heart of Queens County. I was inexperienced in the ways and life of the New Brunswick farmer. I held visions of putting into practice the science of medicine as it had been taught by my betters, and was curious to see how far it could be applied to country conditions; and to that end outfitted myself well with all the diagnostic equipment it seemed possible to use away from an electrical circuit, as well as a competent therapeutic outfit, surgical and medical, wherewith to encourage therapy sometimes within hailing distance of diagnosis in that unequal race. But soon the illusion passed, and it was evident that what was required of me was merely the art of general practice and the furnishing of a village sensation—the modern methodical, unadorned, surer ways and means of medicine were not impressive enough.

I found a people thinking in, trusting in, and acting on superstitions of long ago, and fatalistic, who held it a token of ignorance that one was unwilling to diagnose and prescribe without first examining the patient, and still more so that one might advise observation before labelling an uncertain case; who had no temper for continuous treatment, whose ultimate therapy was the bottle of "doctor's medicine," and who, if this, from the hands of four or five doctors of neighbourly repute, failed, regarded themselves as incurable; all advice as to conduct of living being held valueless. I found prevailing a fear and horror of hospitals, and operative treatment looked on as a short-cut to the grave. It still amuses me, after having done some little operation to hear "What! is he still living! My, what a constitution he must have to come through all that cuttin' up." Primary union is considered unfavourable, and mistrusted; and the post-partum patient should get up on the ninth day irrespective of the size and condition of the involuting uterus, that being the day on which, as everybody ought to know, it goes back into its place. The midwife who prepares the parturient canal for the second stage in a case of "dry birth" by lubricating its walls with oil, lays to Providence the blame for puerperal fever. I was criticized for, among many other things, declining to "draw cancers," but then it was charitably said to be because I knew not the secret of the recipe. And cancers are cancers there, whether the microscope views them as warts or not, and many have been the cures after "drawing" with the old Marsden Paste.

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*A paper read before the New Brunswick Medical Society, July 19th, 1922.

And this population does not quite like being disillusioned; does not like to be divorced from its complacent, comfortable antiquities; does not like to hear that "cold in a wound" comes from somebody's dirty finger-nails, nor that a split boiled fish plastered on the soles can have little effect in drawing out through the feet the pangs of "neuralgy around the heart"; nor that to salt and burn a placenta and leave the ashes undrawn for nine days is labour lost in suppressing after-pains. While some beliefs are harmless and less important than interesting, others are in effect most pernicious and need correction before intelligent co-operation can be attained between patient and physician: both kinds I have mentioned to show what missionary work there still remains to be done amidst our modern Canadian ultra-civilization. People who hold such notions cannot be expected to act rationally in carrying out their doctor's instructions, nor can they understand the rationale and advantages of public health measures; and until they understand they will either ignore or oppose, most effectually nullifying all the good intentions of the Public Health Act toward the country districts, where it is as much needed as in the congested areas.

The blame for this state of affairs we will, of courtesy, avoid placing; the result is a rather difficult adjustment for the new country practitioner. There is in it some connection with the fact that even to-day, and even when coming back from some of our city practitioners, patients give evidence that they have been dismissed with easy rather than exact explanations of their troubles when they solemnly announce that Dr. Z—said they were suffering from "anaemia of the liver" or "had torn the lining of the stomach" or from "falling of the heart" or "had not more than two ounces of blood in your whole body." One has to tell them that they must have misunderstood the doctor: but why cannot we compile a table of standard lay synonyms for medical terms and avoid perpetuating the confusion that brings, to the public, lack of confidence and of clarity and allows ancient fallacies to survive.

But while this simplifying and modernizing the country conception of medical principles is a problem, it should prove a minor one, resting with the country practitioner himself, if his city confrère aids in being painstaking and very precise with his patient from the farm, who undoubtedly is more impressionable than the average.

A really serious problem is getting the right kind of doctor to take up work in the country, and enough of him. Everybody cries out about the lack of quantity; fewer are concerned about the lack of quality, and still fewer search for the causes underlying both. In a past generation the country seems, in many places, to have been the refuge of the man who for one reason or another could not make good in the city—the exceptions were notable. This has created a handicap that still survives, an obstacle to country recruiting. The practitioner who chooses the open becomes a "country doctor" with a certain stigma to the designation, and people ask "Why is he there?" and "Why does he stay there?" That stigma should not exist, and when it goes more men will seek the country. Not many weeks ago I read in a well known Medical Association journal an article in which it was proposed to formulate a lesser course in medicine for undergraduates, qualifying them only for country practice. Utter rubbish!—surely the product of some brain stunted by long confinement within the four walls of a hospital—some man who would be helpless in his own profession without somebody to dispense his drugs and sterilize his dressings and prepare the stains for his microscope and be nursemaid in general to him. The country has no place for undertrained doctors. Why should the accident of a man's domicile affect his rights to proper medical attention? Statisticians tell us that our rural population is the backbone of the country, and as such our farmers are entitled to as efficient medical and state medical care as everybody else, especially since rural habits have made rural morbidity greater than urban. And to get this care they should have better average general practitioners than have the cities, not less good—men who are handy, resourceful enough to get results in spite of lack of technical conveniences and luxuries, who can weigh evidence and make their own decisions with knowledge and training and logic to back them, who can face and solve a problem instead of making that spiritless, lazy surrender that breeds a habit of mental paralysis "Let us call in a consultant." Not that consultants are to be decried—on the contrary there are not half enough of them—but since they are very busy men and not always available our country practitioner must be one less easily stumped than the average. So let us help to solve this problem of the country, the lack of doctors, by giving good men encouragement to go there, feeling that they will receive honour where honour is due, and not stigma. Surely with this removed there are young men forthcoming who would rather live the active, hardy life of the country than the monotony of the city routine of office, hospital, and the same old round of streets. Their service to profession and country need be second to none, and with reasonable self-care they need not grow rusty: there are always with one his eyes, ears, and fingers, which even to-day should be one's chief clinical instruments; there are current journals; there are medical conventions; all these can do much to keep the polish so rightly guarded.

The lode-stone removed, let his prestige be given a fair chance; this, while human nature remains human, will always rest largely with the city physician. It has been, one regrets to say, sometimes a delicate matter for the country doctor even to refer his cases to the city for consultation or special examination—say for a bismuth-meal series, or skiagraph of a newly set fracture. I have heard colleagues, sound men, tell of sending cases to Doctor Röentgen, a general practitioner doing radiography, and of the case being promptly advised by Doctor Röentgen to stay and be treated correctly by himself, since Dr. X—is "only a country doctor." Leaving out of consideration the glaring theft, we might find that Dr. X—, before competent judges, would have been considered the more competent of the two, but an ethical conscience prevents his retaliating; and this treatment hurts his local reputation as well as his feelings; the country patient is always most ready to believe a stranger, and spreads his dictum far and near. And so it comes to pass that, when in doubt, the country practitioner hesitates to take the personal risk of sending his case to an unknown who may unjustly belittle or even libel him and his work, and his reputation suffers thereby; he should be allowed all possible opportunity of finding true consultants, superiors, men of broad mind who even while disagreeing can do so without disrespect to the contrary opinion. There are such—I have been fortunate myself, and know. Unfortunately, while all born of a medical school know to some extent the life of the city and hospital practitioner, it is not often given to the city practitioner to know the life of his country brother, nor the potentialities of his work. When someone claims, for instance, that our operating asepsis in the country cannot be as good as in hospital, one realizes what need there is for better acquaintance. You have been good enough to invite me to your councils to-day, —may I beg of you to enlarge your bounty next year by inviting other country members, giving them a chance to know and be known, to the promotion of sympathy and goodwill and the public benefits that accrue thereby; perhaps even to organize a country section to the New Brunswick Medical Society, and, from that, smaller local case-discussion societies. The country doctor does not rub shoulders enough. Perhaps it seems that my paper to-day savours overmuch of grievances; I hope not, for I have tried to mention only what points the way to a more full mutual understanding: on that, I am convinced, rests the possibility of better co-operation and better service to the rural public with less friction.

Our hospitalization is a problem, even a bogey; when we need the assistance and the machinery of a hospital we need it badly. Yet obstacles are in the way. There is in New Brunswick no provincial hospital to whose upkeep Queens County, for example, contributes, and as a result a patient sent thence to the General Public Hospital in St. John has to pay full cost of maintenance as a public patient. To the very class of patients who most need hospitalization this often is a serious barrier; they simply cannot pay the minimum of three to four dollars a day, and the only alternative is the humiliation of being "put on the parish." Why cannot some well equipped general hospital be made a provincial institution and outside counties be given to understand that when they contribute a certain *per capita* rate to its maintenance each year, their hospitalized cases will be cared for under the same conditions that local city patients now are. In this province there are more people outside hospital maintenance areas than in them, and yet the poor of that majority have to get any hospital attention at a crippling disadvantage. Local small hospitals of the cottage type would be of help provided they were run by some independent body such as the Red Cross or the I.O.D.E., and a sickness insurance fund used in maintenance; but such cannot fill the place of the large general hospital, since pathological laboratory, radiography, electrocardiography, hydropathy and like assets are not practically possible in them.

Give the countryman access to a fully equipped hospital when he needs it, and let him have the same consideration as his city cousin; he may be difficult to treat, and inclined to teach the clinician his business, but at the least he is as worthy as the city man, and has as much right to care. As regards county support, that argument which above all others appeals to County Councils—the practical demonstration of reduced expense—can easily be effected by the country practitioners themselves. County Councils get off altogether too lightly. They should not only support their hospital poor; they should take some of the burden from their doctors who attend poor at home; not nicely segregated in a ward where they may all be seen in a few minutes, but scattered here and there over four hundred square miles, where they are visited separately and given free medicine at the expense of a long-suffering doctor, who should at least be reimbursed by the county for his mileage and cost of drugs. Co-operation is needed again.

Gentlemen, you have listened patiently to my tale of country problems; there are others, but I think you have heard the worst—and in the worst there is nothing that cannot be mitigated by acquaintance, education, and co-operation. May I ask you in the interests of public welfare to encourage these and to tell of any way in which the country practitioner may help. I often wish that we could have lecturers on medical subjects go through the country bringing people more into line with our present day ideas; lecturers who have the gift of creating true mental pictures from non-technical language. There is huge scope here at home for such an enlightening influence, both in preventitive and curative medicine.

I would urge again—try to know your country colleague, and let him know you, and all good will follow among good men.

THE DIAGNOSIS AND TREATMENT OF DUODENAL AND GASTRIC ULCER[*]

E. M. Eberts

Surgeon to the Montreal General Hospital

THE fact that there has been no conspicuous advancement in the diagnosis and treatment of peptic ulcer during the past five years would, broadly speaking, rather indicate that both were approaching a finite stage. However, though there is nothing new to report, a general review of the methods of diagnosis and the treatment employed in this important field of surgery may prove of interest.

The symptoms of gastric and duodenal ulcer may, with advantage, be divided into two groups, major and minor.

Major	*Minor*
Pain	Eructations
Tenderness	Feeling of fulness
Vomiting	Loss of appetite
Haemorrhage	Constipation
Hyperacidity	Loss of weight
Periods of remission	Anaemia

The periodicity of ulcer pain is very characteristic. It comes on at intervals of from one-half to five hours after meals, depending upon the location of the ulcer, and is relieved wholly or in part by vomiting, by alkalis, and in duodenal ulcer (and occasionally in prepyloric) by the taking of food. Pain is usually felt only in the epigastrium, but, when the ulcer is on the posterior wall of the stomach or duodenum, it is referred to the back; and when the lesion is in the prepylorus or upper duodenum and there are adhesions to the neck of the gall-bladder or cystic duct, it may be referred to the right breast or shoulder, resembling the pain of biliary colic.

Tenderness in the epigastrium, usually to the right of the median line, is present during the florid stage of the ulcer, and its increase is indicative of the extension of the ulcerative process toward the peritoneal surface, often indeed of perigastritis and localized peritonitis—portents of perforation.

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[*] Part of Symposium on Chronic Diseases of the Stomach, Montreal Medico-Chirurgical Society, January 6th, 1923.

Vomiting occurs in only twenty or twenty-five per cent. of cases, most frequently in cases of ulceration of the lesser curvature or as the result of pyloric obstruction and stasis. Haemorrhage is also an infrequent sign, occurring in about twenty-three per cent. of cases, but its occurrence is a fairly positive indication of gastric or duodenal ulcer. It must be differentiated, however, from those rare cases of haematemesis (gastrostaxis)[1] occurring at the menstrual period in young women, cases in which the differential diagnosis may be most difficult and where operation is contra-indicated; and also from those cases of haemorrhage from oesophageal varix, the result of hepatic obstruction, hepatic cirrhosis, in which the cause of haemorrhage is seldom in doubt.

Gastric analysis affords valuable information as to the concentration of the gastric secretions, that is, the presence or absence of hyperacidity and the state of gastric motility; but it is fallacious to suppose that hyperacidity invariably connotes ulcer or that the presence of free hydrochloric acid necessarily excludes cancer.

Periods of remission or freedom from symptoms alternate with periods of activity, the intervals between the florid stages gradually becoming shorter. A feeling of fulness and weight, with acid eructations, is an extremely common complaint, but it is in no sense diagnostic.

The appetite is usually well maintained. If the diet is restricted, it is usually done voluntarily to avoid the pain which follows eating. In a recognized case of chronic gastric ulcer, failure of the appetite may be an early indication of carcinomatous change. In cases of pyloric stenosis, whether due to duodenal or gastric ulcer, the loss of appetite accords with the degree of stenosis. Broadly speaking, however, loss of appetite suggests carcinoma rather than ulcer.

Constipation is coincident with a restriction in diet. It is most pronounced when there is pyloric obstruction. Loss of weight also occurs during periods of activity in the ulcer, when less food is taken. In the intervals between so-called "attacks," the gain in weight is usually rapid. The most noticeable loss of weight results from frequent vomiting or obstruction. Although pronounced anaemia may be produced by haemorrhage, anaemia is not a feature in the average case.

In view of the serious consequences which may attend a delay in diagnosis and treatment, one would seem justified in urging that all cases of dyspepsia in adults be carefully investigated. In gastric ulcer the particular menace is carcinoma; in duodenal ulcer, perforation and peritonitis. The Mayo Clinic[2] reports that, in a group of ninety-four cases of ulcer and advanced carcinoma of the stomach, a history of ulcer extending on an average over a period of eleven years was elicited. Hospital statistics show that a large percentage of duodenal ulcers are perforated on admission. In the Montreal General Hospital surgical records for the past four years, I find that sixty-two cases of duodenal ulcer were operated upon, and of these twenty were perforated. The most neglectful patients in this respect would seem to be the farmers, who, because of their otherwise robust health, complain little and late. In support of this statement, I may say that from one agricultural district I have had admitted to my service six cases of duodenal or prepyloric ulcer, all of which were perforated on admission. Furthermore, it is frequently those cases with mild symptoms which perforate.

While it is to the radiographic findings that we must look for a final diagnosis as to the location and mechanical effects of organic lesions of the stomach and duodenum, I feel very strongly that the barium meal should not take the place of a preliminary investigation of the symptoms, but should, in a majority of the cases, merely confirm a diagnosis already arrived at.

In an early duodenal lesion the x-ray usually shows hypertonicity (firm contraction upon contents), hyperperistalsis, hypermotility (rapid emptying), and the absence of duodenal shadow (duodenal spasm). Later, in the florid stage, associated with a certain amount of scar formation, we may or may not have hypertonicity, hyperperistalsis, and hypermotility in combination, but there is usually less rapid emptying and a deformed duodenal cap. In the late stages, where scarring is advanced, we have a dilated flaccid stomach and twelve to twenty-four hour retention. These features are also met with in peptic ulcer situated immediately proximal to the pyloric ring.

In lesions of the body of the stomach, those ulcers which develop astride the lesser curvature are the most common and may be associated with pyloric spasm. They are radiographically to be diagnosed by hypertonicity, hyperperistalsis, and deformity of the lesser curvature. Ulcers in this location may, in the early stages, as pointed out first by Schmieden,[3] give rise to the radiographic picture of incomplete hour-glass stomach or incisura, owing to a spasm of the circular fibres, which, however, disappears under the hypodermic administration of atropine or under a general anaesthetic. Both Schmieden and Hochenegg lay stress upon the importance of exploring such stomachs for ulcer in the region of the lesser curvature, even if no visible or palpable lesion is found when the abdomen is first opened.

Ulcer of the posterior wall may be demonstrated radiographically by lateral views, showing adhesions to the pancreas, or by the use of the compression bag and the demonstration of a bismuth rest in the crater of the ulcer, or by rotation of the patient during fluoroscopic examination. There is one radiographic feature which is common to all advanced ulcerative lesions of the stomach and duodenum, namely, the barium rest due to a retention of barium in the crater of a chronic ulcer or the lodgment of barium in a false sac or perigastric or periduodenal space. Finally, a marked gastric retention is strong corroborative evidence of an organic lesion.

In the general run of cases, if there is no evident hour-glass constriction, no characteristic barium rest, or no marked gastric retention, a reliable radiographic diagnosis of gastric or duodenal ulcer can be made only by a roentgenologist of large experience and conservative views.

Although there are many operations for the relief of gastric and duodenal ulcer, they have all in common certain definite aims: (1) to eradicate the lesion responsible for the symptoms; (2) to alter the chemical condition thought to be responsible for the development of the lesion; (3) to promote healing of the ulcer by lowering the intragastric tension, reducing peristalsis, and diverting the food stream; and (4) to overcome obstruction. Only one or all of these objects may be attainable. If it can be done without too great a risk, the ulcer should always be removed. The method employed, of course, will not be the same in every case.

Gastro-jejunostomy and pyloroplasty (Finney)[4] admit the alkaline pancreatic juice directly into the stomach, and so lead to a diminution in the quantity and concentration of the gastric secretions, partly through simple chemical neutralization, partly through the reflex action of the pancreatic juice upon the gastric mucosa, and partly through the rapid emptying of the stomach, which lessens the period of time during which acid secretion is maintained. One may say, parenthetically, that it is believed by Patterson[5] and many others, that the admission of pancreatic secretion into the stomach confers upon that organ the immunity to carcinoma which is generally conceded to be the birthright of the small intestine. In confirmation of this belief, I think I am justified in saying that gastric ulcers which show no signs of malignancy at operation, but which for some reason, clinical or technical, cannot be removed, seldom undergo carcinomatous change after gastro-enterostomy. If we accept the view that ulcer is a common precursor of cancer, this is very striking.

In cases of duodenal or gastro-duodenal ulcer which have gone on to healing, cicatrization, and pronounced stenosis, it is generally conceded that the best results are secured by gastro-jejunostomy. Indeed, in the light of postoperative experience, one might say that the functional results vary directly with the degree of stenosis. One might even assert that, in cases which have been shown by repeated x-rays to have a six-hour retention, there are very few failures from gastro-enterostomy. Schnitzler[6] believes that gastro-enterostomy is indicated only in cases of stenosis.

The exceptional functional results which are noted following gastro-enterostomy in cicatricial pyloric stenosis are ascribed by Pool[7] to the relief of the intragastric tension and the reduction in peristalsis. It is his opinion that the relief of intragastric tension is a more important factor in securing rest for and promoting healing in the ulcer than is the diversion of the food stream From an analysis of fluoroscopic findings, after gastro-enterostomy, A. L. Holland[8] concludes that the good results do not depend upon the "complete occlusion of the pylorus, since in practically all cases the antrum and duodenum (cap) can be filled under pressure."

The failures from gastro-enterostomy, aside from those which are inexplicable, fall under two headings: (1) those from technical errors, and (2) those from a wrongly elected operation. The technical errors most commonly responsible for an unsuccessful gastro-enterostomy are (1) misplacement of the stoma, and (2) making the stoma too large. The stoma should always be at the most dependent portion of the stomach, or at a point on the greater curvature directly in line with the vertical portion of the lesser curvature. From an investigation of the late functional results of gastro-enterostomy, Wilensky[9] concludes that the stoma secured by the button operation, admitting one finger and approximately the size of the pyloric opening, gives the best functional results. Too large a stoma permits an excessive rate of evacuation of the stomach, with resulting intestinal indigestion.

It appears to be fairly well established, that the symptomatic failures following gastro-enterostomy are most common in those cases in which the operation has been performed for a simple non-obstructing ulcer in the neighbourhood of the pyloric ring, and these failures have led to the adoption of less radical measures.

The simplest procedure for anterior duodenal ulcer is excision without gastro-enterostomy. This method has been followed by Judd[10] in a series of 400 cases, with satisfactory results. This is due, possibly, to the fact that simple excision of a duodenal ulcer always leads to a reduction in the acidity of the gastric juice. Cautery excision (Balfour)[11] with suture of the defect, followed by gastro-jejunostomy, is also a well-established practice.

Duodenal ulcer on the posterior wall should be cauterized, and, if possible, excised, especially if there be a history of haemorrhage: but this lesion, if some distance beyond the pylorus, cannot be dealt with with ease and safety, and one must frequently rely upon gastro-jejunostomy alone. It is in this type of case that symptoms most often recur after operation.

In old duodenal ulcer situated immediately beyond the sphincter and in prepyloric ulcer (the gastro-duodenal group), one may choose between Finney's pyloroplasty and the operation known as Billroth II[12] (partial pylorectomy and gastro-enterostomy). There is a growing feeling that Finney's operation should frequently be the procedure of choice, especially if the ulcer can be removed at the same time. In considering the relative advantages of the two procedures, one must bear in mind that Billroth's operation carries with it the possibility of sequelae common to all gastro-enterostomies, namely, acute dilatation of the stomach, the development of a vicious circle, obstruction due to kinking or adhesions, peritonitis, and the development of a gastro-jejunal ulcer.

In chronic ulcer of the antrum, with wide inflammatory infiltration, the operation of choice is partial pylorectomy and Polya's[13] anastomosis with the first part of the jejunum, a more rapid procedure than Billroth II and very much safer, if a large part of the pyloric portion of the stomach is to be removed, because in Billroth's operation, owing to the impaired blood supply in the interval between the distal suture line of the stomach and the gastro-enterostomy, there is always the danger that the suture line may give way. Balfour's[14] modification of the Polya operation, that is the anastomosis of the distal portion of the stomach with the small bowel, about eighteen inches from the duodeno-jejunal junction, is more suitable for subtotal gastrectomies performed for carcinoma.

Saddle ulcers of the lesser curvature are, as a rule, easily removed by a diamond or V-shaped excision, after the gastro-hepatic omentum has been partially divided. The closure of the stomach should be transverse. Whether or not gastro-enterostomy should be performed at the same time, is a question which must be decided in the individual case. If the ulcer is extensive and a considerable length of the lesser curvature must be sacrificed, Alvarez[15] advises the operation of resection in continuity, which, though more hazardous, is said to give better functional results, because of the removal of corresponding lengths of both curvatures, which involves no interference with the synchronized peristaltic impulses travelling from the cardia along the lesser and greater curvatures. Against this procedure, in addition to the immediate risks, must be considered the possibility of the development of an hour-glass deformity. In a small series of cases, Judd[16] has demonstrated that, after segmental resection, there was a reduction of fourteen each in the total acidity and the free hydrochloric acid. Whether this reduction in the acidity results from the excision of an irritating lesion or from the coincident removal of a considerable area of acid-secreting mucosa, cannot be definitely stated, although, as mentioned before, the excision of a purely duodenal lesion invariably leads to a reduction in the acidity of the gastric juice.

By the same route one may now, with comparative safety, excise ulcers, even penetrating ulcers, of the posterior wall of the stomach (Mayo)[17]. As these ulcers of the posterior wall frequently bleed profusely, sometimes causing death, one is warranted in taking additional risks in eliminating them. Otherwise, one has no protection against death from haemorrhage after a perfectly smooth recovery from a gastro-enterostomy.

In the treatment of hour-glass deformity there are alternative procedures: segmental resection and gastro-gastrostomy (the anastomosis of the two sacs). Where the sacs are equal in size and there is no pyloric obstruction, Sir Berkeley Moynihan[18] advises a simple gastro-gastrostomy This, of course, leaves to the uncovenanted mercies the fate of the ulcer. For this reason there are many advocates of the more radical segmental resection, though Moynihan thinks that it is often followed by a recurrence of the hour-glass deformity.

With regard to perforated ulcer, it is still a moot point whether gastro-enterostomy should be performed as a routine measure after closure of the perforation. Owing to the added operative risk and the danger of sequelae, Pool[7] thinks that an initial gastro-jejunostomy should be performed only in those cases in which there seems to be a constriction of the pylorus after suture of the perforation. In a series of thirty-one cases in which simple closure was done, twenty-one remained free from symptoms, and ten had a recurrence. In seven of these a subsequent gastro-enterostomy was done for the relief of pyloric obstruction. The other three still have symptoms, but have had no further operation. Pool believes that it is better to do a secondary gastro-enterostomy in a third of the cases than to submit all to a prophylactic gastro-enterostomy at the initial operation, which in a certain number of cases is likely to prove a failure.

Hromada and Newman[19] think that simple closure of the ulcer should be abandoned for the more radical excision with gastro-enterostomy (BillrothII). In support of their contention they cite the interesting case of Dr. C. K. P. Henry,[20] in which radical treatment of the ulcer was finally undertaken at the fifth laparotomy. Their own results, however, are less favourable than Pool's: in nineteen cases there were fourteen recoveries and five deaths.

In perforated gastric and duodenal ulcers, as in all perforative lesions of the intestinal tract, the prognosis depends upon the time which elapses between perforation and operation. Pool reports that in forty cases of perforated duodenal ulcer operated upon within six hours after perforation there were no deaths; in nine cases operated upon between six and twenty-two hours after perforation there were four deaths; and in nine cases operated upon twenty-two hours or more after perforation there were seven deaths.

Post-operative treatment. Should vomiting occur after operation, stomach lavage should be promptly practised. Dehydration is prevented by the administration of six ounces of glucose saline (5-10%) per rectum every four hours and small quantities of water by mouth. The frequent use of a mouth wash is essential; the addition of lemon juice is of value in stimulating parotid secretion and lessening the danger of parotid infection. Where indicated, the heart's action should be sustained by the hypodermic administration of caffein citrate every four hours. Calomel and castor oil should be administered on alternate nights to prevent fermentation. Lenhartz diet should be begun on the third day, and all increases should attend upon the appetite.

To secure the best results, prolonged after-treatment is essential. A routine life and diet should be prescribed. Finney's diet list[21] is admirable. Meals should be small and frequent, and food should be thoroughly masticated. Sodium bicarbonate, (Squibbs) taken at bedtime is helpful in restoring and maintaining normal gastric function.

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THE INFLUENCE OF CHRONIC DISEASE OF THE GALL-BLADDER IN PRODUCING STOMACH SYMPTOMS

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It is for me in opening this part of the discussion to remind you that diseases of the gall-bladder do give rise to stomach disorders. It has been said that an illness beginning with localized pain in the right lower quadrant is not appendicitis; that of course is not true; but the saying contains this seed of wisdom—that epigastric pain, eructations of gas and vomiting, do not localize intra-abdominal disease.

That I might be able to say that these are the signs and symptoms associated with gall-bladder disease, I have read over carefully the case records of the last one hundred cases of chronic or recurring gall-bladder disease and the last fifty cases of chronic gastric or duodenal ulcer admitted to the Royal Victoria Hospital. I have only used the records of those cases in which the diagnosis was confirmed by operation, with the object of correlating, if possible, the symptoms with the condition found. May I say here that I was pleased, almost surprised, to find that the clinical picture was in most cases distinct; and that it corresponded fairly exactly with our generally accepted teaching on the subject.

The study of the gall-bladder records gave some interesting information. There were few wrong diagnoses as between gall-bladder and stomach disease—not more than five or six. There were more, and these I have excluded from my study, where the evidence of disease found at operation was not sufficiently definite to make one sure that the cause of the symptoms had been found. Some of them were in that class which Dr. Finney once termed in discussion; "not a normal appendix mind you." These I will leave to the medical representatives in our evening discussion.

The large majority of the proven cases of gall-bladder disease gave a distinctive and fairly constant history of repeated attacks of pain over a period of months or years, nearly always localized to the "right upper quadrant," "below the right costal border," "in the gall-bladder region." The pain was often felt through to the back and sometimes between the shoulder blades; rarely (*e.g.* in two instances) was it noted as being felt in the right shoulder or in the right side of the neck. It is to be noted that the pain associated with disease of the stomach, when it was severe, was referred to the back about as often as was the pain from the gall-bladder.

The pain was described as colicky, paroxysmal, boring, or stabbing. It was associated with nausea and vomiting which sometimes gave relief. The duration of the attack was a few hours up to some days and subsided gradually, leaving a soreness below the right costal border. In the intervals between the attacks the patients were frequently, but not always, well. There was often a history of nausea, eructations of gas, and constipation. If well, they were perfectly well and could eat all kinds of food without discomfort.

The nausea, eructations of gas, and constipation, when complained of, were felt irregularly during the interval, sometimes preceding or following an attack of pain, and sometimes they were associated with heartburn which was relieved by soda and food. Such were the typical cases and the symptoms fall into two classes; (1) with the symptoms of the attack and pain localized to the right upper quadrant nausea, and vomiting which gave no relief; (2) with an underlying cramp, soreness in epigastrium, eructations of gas, heartburn, and constipation.

In a minority of the cases, the main history was a recurrence of periods of dull, aching pain in the epigastrium with eructations of gas, and occasional vomiting. Such pain was often relieved by soda and by food. Rarely, however, in a proved case of cholecystitis or cholelithiasis was there not some history of acute pain localized to the right upper quadrant. Pain referred to the shoulder was not frequently noted, and when noted, it was usually brought out as the result of questioning. Jaundice was an infrequent occurrence.

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In some five of the 100 cases there was no history of severe attacks of pain, only a grumbling, gnawing pain relieved by food and alkalis and not to be distinguished by the history alone from the pain of stomach diseases as the history was that of the associated hyperacidity. Such a case was the following: No. 20,707.—Onset six months ago with epigastric distress, sensations of weight in stomach, eructations of gas with foul odour, voluntary limitation of food, and constipation; later, gnawing, epigastric pain two hours after meals, relieved by soda and food. Barium meal showed a small poorly formed cap. At operation the stomach and duodenum were found to be normal. The gall-bladder was white and thickened; there were no stones. Microscopic sections showed an almost complete absence of gall-bladder mucosa. There seemed to be nothing here to account for the symptoms except an obviously diseased gall-bladder.

We have, then, throughout the whole series, a recurring group of stomach symptoms resembling the picture of hyperacidity, sometimes with a moderate retention. During the acute attack these symptoms are submerged by the more violent ones of pain and vomiting but reappear during the intervals. In others, the lesser signs dominate the picture and excuse, as in the case quoted above, a diagnosis of gastric or duodenal ulcer.

It was interesting during the subsequent reading of the gastric and duodenal ulcer series to get the feeling of a much less stormy disease than in the gall-bladder cases; distress rather than pain, or a nagging miserable pain, generally of a persistent character, rather than pain in paroxysmal attacks. There was also less complete freedom from symptoms during the intervals of comparative well-being and a more definite association with the taking of food; by this I mean not so much the relief from soda and food as in the hyperacid cases, but the inability to take food on account of its being followed by pain.

I think that we are inclined to accept vaguely this scattering of symptoms over the whole intestinal tract and this confusing variability as a part of the nature of the disease, or almost as vaguely, we regard these symptoms as reflex, rather than search for an explanation of their occurrence. Only by understanding the why and the how can clearness come. For this explanation we must look to the nervous system through which all disorders are perceived. For this part I will quote indiscriminately from publications by Gaskell, Pottinger, Hertz, Sherrington, MacKenzie and others.

The gastro-intestinal tract has a double nerve supply almost throughout. In the areas under discussion there are the vagus; representing the parasympathetic and the sympathetic. Everywhere the effects of stimulation, direct and reflex of the motor and secretory fibres of these nerves are opposed to one another. The parasympathetic, represented by the vagus, causes contraction, increased tone and increased secretion, except in the case of certain sphincters. The sympathetic brings about relaxation, loss of tone, and diminished secretion. Neither of these nerve systems recognize pressure, heat, or cutting as touch or pain; at least this is true in normal states. It is held by some authorities, therefore, that all recognition, *i.e.*, through pain, of diseased conditions must be by means of a reflex through the skeletal nerves. It is held by others—and this is more acceptable to me—that the normal stimulus of these organs is distension, and that excessive distension or tension will overcome the resistances to reach the cervical areas and be recognized as pain, and this phenomenon occurs all the more readily in inflamed states of the organs. A pain therefore could be felt and localized in the diseased organ even though that organ were insensitive to pressure, heat, or cutting.

Besides these nerves in the vegetative system the areolar tissue just outside the parietal peritoneum is supplied with spinal nerves sensitive to touch. The under surface of the diaphragm also, through the intercostals, is sensitive to pressure; and the dome of the diaphragm, through a phrenic reflex, refers pain to the neck and shoulder.

The distribution of the vagus is a wide one. It supplies fibres to the heart, lungs, oesophagus, stomach, liver, gall-bladder, small and large intestine to the transverse colon. It contains both ingoing and outgoing fibres but it does not connect with the spinal nerves whose normal function is the recognition of pressure as touch and pain.

The internal viscera are segmentally related to the skin segments through the sympathetic connector neurons. The diaphragm with the IIIrd and IVth cervical segments, the heart with the Vth and VIth dorsal and the stomach, liver, gall-bladder and pancreas with the Vth—IXth, reflecting strongest in the VIth and VIIth. The stomach and pancreas refer pain reflexly to the left side of the body, the liver and gall-bladder to the right side, but all these reflexes are in the same segments.

From this it is clear then an incoming stimulus along the vagus will, on completion of its reflex, tend to cause contraction and increase in secretion not only in the organ diseased, but will spread its influence over all the viscera supplied by its fibres, and will be of little value for localization. The sympathetic, on the other hand, has connecting fibres, through its ganglia, with the spinal nerves and will, therefore, tend to be associated with sensory and motor reflexes in the corresponding skeletal muscles.

To illustrate from our gall-bladder cases as I conceive it may occur: A stone becomes impacted in the cystic duct, the irritation sets up a spasm of muscle with distension of the gall-bladder. This, being an exaggeration of the normal, may be perceived directly as pain in the organ, or reflexly, through its sympathetic connection with the Vth—IXth dorsal segments, as pain with rigidity of the right rectus. At the same time vagus reflexes are set up which are distributed widely as spasm of muscle in the stomach and intestine with increased secretion. In the less acute conditions, the vagus reflexes may predominate and we get, in the intervals, disturbed function of the stomach or of the intestines, eructations of gas, hypermotility, hyperacidity, constipation.

Thus we may get at least a working understanding of the variability of symptoms in the same disease and its influence on neighbouring organs.

CHRONIC APPENDICITIS: ITS DIFFERENTIAL DIAGNOSIS AND TREATMENT*

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"CASES of chronic appendicitis in which the stomach symptoms predominate have been a stumbling block in the past to both physician and surgeon, and even to-day the symptomatology of the condition is far from being definitely settled."—*Graham.*

Chronic indigestion is most typically exemplified in chronic peptic ulcer, diseases of the gall-bladder, appendicitis, and cancer of the stomach, but we must bear in mind the digestive disturbances which accompany pulmonary tuberculosis, tuberculosis of the ilio-caecal region, and pancreatitis, and such constitutional diseases as Bright's disease and pernicious anaemia. It is only through painstaking care in clinical and special examination of sufferers who present themselves because of digestive disorders that a correct diagnosis can be reached.

Patterson says: "The evidence that the gastric symptoms in many cases which simulate gastric or duodenal ulcer, and in some cases of acid dyspepsia, are due to appendicular disease is three-fold. (a) The majority of the patients are cured by appendectomy, (b) the influence which appendectomy has on the gastric contents, and (c) the frequency of a previous history of gastric symptoms in those who have an attack of acute appendicitis."

The disease, chronic appendicitis, may be considered from both the pathologist's and the clinician's point of view; for the purpose of this symposium it is the clinical diagnosis to which we must reserve our attention. That as a pathologic entity, chronic inflammatory changes in the appendix may and do occur, is recognized by everyone. Oskar Klotz, in a recent analysis of 5,647 appendices examined, found that 1,718 exhibited chronic interstitial lesions, 1,689 had adhesions, 832 were obliterated, and 195 had concretions. It is not my intention to enter further into the subject from the pathologist's point of view except to point out that, theoretically at least, we may assume that the chronic lesion in the appendix may be the result of a primary low grade type of reaction to invasion of the tissues by micro-organisms of low virulence. On the other hand, the chronic inflammatory changes may be the residual effects which have persisted following one or more acute inflammatory reactions. The lesions which occur are thus analagous to those which are found in the tonsils, organs which, insofar as they are composed chiefly of lymphatic tissue, are very similar in nature to the appendix vermiformis.

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The history of more or less severe acute attacks is very commonly present in cases of chronic appendicitis. Such an acute attack may indicate the onset of disease of the appendix and be the originator of the chronic changes. On the other hand, such acute attacks may be really acute exacerbations of a chronic appendicitis which has insidiously developed.

Enough has been said to prove that chronic appendicitis constitutes a definite lesion. Our function this evening is to indicate, if possible, the manner in which such a diagnosis may be established clinically, and having done so, to suggest treatment.

The patient suffering from chronic appendicitis presents symptoms referable to the abdomen, chiefly digestive in character, and also symptoms referred to organs in other parts of the body. Outside the abdomen we have usually a history of fatigue, lassitude, headache, backache, joint and muscle pains. It will be noted that this symptom complex is similar to that usually associated with chronic intestinal stasis or with visceroptosis. These symptoms, therefore, are not of any direct value in a differential diagnosis, but, inasmuch as constipation commonly interferes with drainage of the appendix and consequently increases the frequency of attacks of inflammation in the appendix, and since, moreover, chronic inflammatory changes in the right lower quadrant of the abdomen, consequent upon inflammation of the appendix, are prone to cause and to increase stasis in the caecum and ascending colon, we find a real reason for this symptom complex. In addition the diseased appendix may act as a focus of infection from which tissue toxins are absorbed.

The diagnosis of chronic appendicitis must be reached largely by a process of exclusion: gastric and more particularly duodenal, ulcer must be seriously considered in every case and all forms of examination, which might be expected to substantiate such a diagnosis, utilized. Although gall-bladder disease is usually diagnosed without much difficulty there are a moderate number of cases in which doubt as to the nature of the lesion remains. In every case, therefore, before the diagnosis of recurrent mild or chronic appendicitis is accepted the history must be carefully reviewed in order that disease of the bile passages may be excluded.

The most common abdominal symptoms complained of are epigastric discomfort and the belching of "gas." In many cases the patient gives a history of constipation, occasionally with intermittent periods of diarrhoea, and of occasional attacks of nausea.

The discomfort which is usually described as pain of a mild sort in the epigastrium, is characterized by the irregularity in its time of onset as compared with the discomfort complained of in cases of gastric or duodenal ulcer. As a rule the patient awakes in the morning free from discomfort, breakfast is eaten with a relish, but about one hour later a feeling of oppression or real pain in the epigastrium, or about the umbilicus, is noted. This discomfort persists throughout the day, although often relieved by the taking of food, it is usually not entirely corrected in this way, and is frequently increased following a meal.

The most outstanding characteristic of the upper abdominal pain which characterizes appendicular gastralgia is that it is usually worse upon exertion. Again, although many cases obtain a moderate degree of relief immediately following the ingestion of food or alkalies, in the majority of cases pain appears soon after, or is caused directly, by food.

The pain rarely reaches the severity of that accompanying gall stones, but is more prolonged, nor does it often reach the constancy and intensity during the whole attack that it does in cases of chronic ulcer. Capriciousness, in the time of onset, and in intensity of the pain, is striking in cases of chronic appendicitis. Upon one occasion the patient receives relief by taking food; more frequently, the ingestion of food instead of bringing ease, as is uniformly the case in chronic ulcer, produces early if not immediate discomfort. Radiation of gastric pain toward or about the umbilicus or lower abdomen is more suggestive of appendiceal disturbance than of disease of the stomach, duodenum, or gall-bladder.

Tenderness is usually present over MacBurney's point, although patients do not always complain of pain in this neighborhood. An interesting symptom is that epigastric discomfort may be complained of when pressure is made over the appendix.

Patients suffering from chronic appendicitis have periodic attacks which are in many respects comparable to those which characterize duodenal disturbance. The seasonal periodicity is not, however, present, nor is the return to health between attacks as complete as in duodenal lesions. Vomiting is present in chronic appendicitis, but is a less prominent symptom than in ulcer, and does not afford such a marked degree of relief. In chronic appendicitis the appetite often fails, or it is so variable that it helps in distinguishing appendicitis from ulcer. In other cases food is refused through fear of distress.

Nutrition, therefore, usually suffers in cases of chronic appendicitis on account of the diminished appetite and fear of taking food. Loss of weight in cases of early ulcer does not occur unless vomiting is excessive. Nutrition of the patient suffering from gall-bladder disease is usually well maintained.

Information obtained by means of the test meal is of value primarily because it is negative. Hyperacidity, normal acid content, and hypoacidity may be found on repeated examination of the same case upon different days.

Radiologically negative information is of value in that it is usually possible to exclude duodenal ulcer. Gall-bladder disease is less surely diagnosed by this form of examination. Suggestive information can be obtained by noting the function of the stomach when an opaque meal is ingested. As a rule hypermotility and decrease in the emptying time of the stomach is thus noted; in other words the stomach appears to be affected by some form of nervous irritation. In a smaller proportion of patients, pyloric spasm, consequent upon disease of the appendix, causes a delay in the emptying time and may make difficult the differential diagnosis of ulcer in the first part of the duodenum.

Direct examination of the right lower quadrant frequently shows an opaque substance in the appendix. In this connection undue retention of the opaque substance may be accepted as proof of inadequate drainage from the appendix, and is of very considerable confirmatory value. It is obvious, however, that the absence of such a phenomenon cannot be accepted as proof that disease of the appendix itself does not exist.

Perhaps the most important of all differential diagnoses are those which aim to exclude pure neuroses, and digestive disorders which are accompanied by, or in many cases due to, stasis of intestinal contents at the ileo-caecal valve or in the large bowel. Time does not permit a complete discussion of the relative importance of caecal stasis as a causative factor in appendicitis, nor of the importance of recurrent appendicitis in stimulating the formation of adhesions about the ascending colon which may prevent the easy passage of intestinal contents from, and into, the caecum. In any event, this subject may be disposed of by the statement that after all the same forms of treatment, whether operative or otherwise, which have been proven useful in the one disease are largely applicable to the other.

TREATMENT

"The only form of treatment of chronic appendicitis is operative and any other advice when this diagnosis is made must be considered faulty and perhaps dangerous."—*Graham.*

No proof of disease of the stomach or duodenum having been obtained and operation for the removal of the appendix having been determined upon, the question arises as to whether an exploratory operation upon the upper abdomen should be performed and the appendix removed incidentally, or whether the incision to be employed should be one adapted primarily for removal of the appendix. I am of the opinion that in the great majority of cases it is possible to exclude without visual inspection organic disease of the stomach and duodenum.

An incision above the umbilicus sufficiently large to permit adequate examination of the stomach and duodenum requires a relatively prolonged post-operative recumbency, and in a moderately large proportion of cases is followed by definite symptoms referable to the abdominal wall injury. On the other hand, an incision over the appendix, whether of the MacBurney or the Davis type, requires a very short period of rest in bed and is not followed by symptoms referable to the wound as such.

If the incision be placed somewhat higher than usual the appendix is easily removed, and the terminal ileum, the caecum, and ascending colon visually inspected; the pelvic organs in the female can be adequately palpated and if necessary brought into view. The gall-bladder, with such an incision, cannot be visually inspected, but may be palpated sufficiently well to exclude disease in this organ. The stomach and duodenum, in my opinion, cannot be thus explored satisfactorily. As a general rule I am in favour of the employment of the appendectomy incision, granted that adequate pre-operative examinations have been carried out.

Moynihan draws attention to an important feature of appendix dyspepsia. He says, "Removal of the inflammatory and obstructed appendix is generally followed by a complete and instant relief of all forms of dyspepsia, the cessation of symptoms may, however, come only by degrees and with the lapse of many weeks."

Probably no form of operative interference requires more careful and prolonged post-operative treatment and observation of the affected individual than does the case of chronic appendicitis. The majority of these patients are below weight, easily fatigued, and have developed the habit of constipation. Following operation the confidence of the patient, which should have been obtained prior to operation, must be retained. He or she should be urged to pay periodic visits to the surgeon, or a medical colleague, for at least three months following operation.

Since adhesions about the terminal ileum, or head of the caecum, or the ascending colon are usually present, and since experience has shown that much may be done to re-establish the function of this part of the bowel by special efforts which have as their aim the maintenance of the bowel in as nearly an empty condition as possible, the patient must be urged to adopt adequate measures to promote evacuation of the large bowel. In order that the patient's help may be thus obtained it is essential that the instructions given should be specific and that results obtained should be controlled, not only by careful catechising, but also by repeated abdominal examinations. The surgeon, or his medical colleague, should after careful consideration of the facts of the case recommend a very definite outline of the procedures which the patient should carry out.

If we expect to obtain 100 per cent. cures in the treatment of cases diagnosed as chronic appendicitis, it would appear that we are bound to be disappointed. This does not necessarily mean that the diagnosis cannot be correctly made, but is more often, I believe, due to the fact that prolonged local inflammation in the right side of the abdomen has induced secondary changes, particularly by the production of adhesions, but also of the nature of malfunction on the part of the large bowel which are sometimes impossible to correct. In many cases, however, in which at first we appear to be doomed to disappointment, prolonged post-operative care will be rewarded by a patient who is returned to normal usefulness.

Despite the fact that there is a fair proportion of operative failures, there is a unanimity of opinion on the part of all who have published reports of their results that cures are obtained in from 60 to 80 per cent. When these results are compared with those obtained in the treatment of gall-bladder disease and of duodenal ulcers it is seen that, although much improvement is to be hoped for, there is no reason for being discouraged. The operation itself is so trivial and is accompanied by such a short period of invalidism, referable to the operation itself, that we feel justified in recommending operative interference in all cases in which the diagnosis of mild recurrent or chronic appendicitis seems reasonably established. In my experience no type of case has given such gratifying results with so little risk tc the patient as cases of chronic appendicitis.

VISCEROPTOSIS*

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Montreal

I WISH to draw to your attention, as briefly as possible, some of the symptoms of chronic, gastro-intestinal disorders which call for medical rather than for surgical treatment. Although it is necessary in making our diagnosis, to refer to many signs and symptoms you have heard and will hear of in the other papers, I have tried to consider the subject as much as possible from a medical standpoint.

A very large proportion of people who suffer from chronic diseases have symptoms which they refer to their gastro-intestinal tract. Many of these sufferers have not been ill enough to discontinue their daily duties, and have contented themselves with a bottle of some patent medicine or a more or less casual visit to a busy doctor for advice and a bottle of tonic. A great many of these people are sufferers from some form of constitutional disease, such as oral sepsis, or tuberculosis; a feeling of fulness and gas in the stomach may be due a badly acting heart; an examination of the blood may disclose the fact that symptoms of hyperacidity are due to an unsuspected syphilitic infection. But when we recognize and set aside these sufferers from constitutional disease, there remain still many others.

This remainder includes—in addition to persons suffering from some form of organic disease (with which the other speakers have to deal)—a great many who suffer from *visceroptosis*. It is chiefly about these people that I wish to speak tonight in order to direct your attention to the condition and that you may bear it in mind and give it proper consideration when searching for the cause of the manifold symptoms of which these patients complain. Persons with visceroptosis are often treated for months or years for anaemia, constipation or dilatation of the stomach, without the underlying cause being recognized, and they take a great many remedies with little or no benefit. Their symptoms are, for the most part, of a vague and chronic character but from time to time they assume a more acute form and we then may have great difficulty in deciding whether our patient is or is not suffering from some inflammatory condition, such as inflammation of the appendix or gall-bladder or of the uterine appendages, to the symptoms of which these acute exacerbations show a most remarkable similarity. The importance of a correct diagnosis is evident, as the treatment of the two conditions is absolutely different. In the one it is essentially surgical and in the other essentially non-surgical, that is, symptomatic, dietetic, hygienic, medical.

These persons with visceroptosis, most of whom are women, come to the medical man complaining of nausea, anorexia, distress after eating, eructations of gas, flatulence, and constipation, and often of loss of weight and strength, and of frequent attacks of headache, abdominal pain, and vomiting The diagnosis is made on the history, on the physical examination and by ruling out organic disease of the various abdominal organs by means of x-ray examinations and laboratory tests. These patients can be divided into two types (as recognized by Ebright). There is the (1) *hereditary type* where the individual has been born with all the structural defects favouring the development of the condition, and (2) the *acquired type* which may follow a long illness, frequent pregnancies, or a too sudden reduction of weight.

The hereditary type is the tall, thin, often stooped, individual, with a long flat thorax, relaxed vaso-motor system, and low blood pressure and who often suffers, in addition, from weak ankles and flat feet. In other words, this type is inevery way the opposite to what may be considered the athletic type. X-ray examinations show a small "drop" heart and often unattached ninth and tenth ribs The stomach is low and atonic and, because of the atony, always more or less dilated. The peristaltic waves are slow and rather weak, so that food tends to remain longer in the stomach than normal thus causing anorexia, nausea, and more or less gas. The mesentery is usually elongated allowing the small intestine to sag into the pelvis, which condition along with the flabby musculature of the intestinal wall, controlled by the too easily influenced nervous system, favours the development of abnormal contraction and dilatation of portions of the bowel resulting in the vague pains so often complained of. The caecum and colon which are often displaced, atonic, and sluggish tend to become loaded with faeces, causing constipation, so that when we think of the position of the stomach and intestines and of the weak muscles of the intestinal walls and supporting structures we can realize the cause for the more chronic of the complaints.

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*A paper read as part of a symposium before the Montreal Medico-Chirurgical Society, January 5th, 1923.

The more acute symptoms are the result of the colon becoming loaded with faeces. When this happens we get an irritable condition developed in the caecum about the ileo-caecal valve and in the last portion of the ileum. This may be considered as *an attempt to prevent further overloading of the large bowel* by a closing off of the ileo caecal valve, and this attempt, acting probably through the vagus nerve, causes a reflex and spastic contraction of the pylorus. This spasm of the pylorus causes pain and sets up strong gastric peristalsis, which is an attempt of the stomach to overcome the spasm but which finally results in a relaxation of the cardiac sphincter and the vomiting of acid gastric secretion and whatever food happens to be in the stomach. The spasm of the pylorus then relaxes *allowing bile and duodenal contents to be, first, regurgitated into the stomach and then vomited*, giving immediate relief from pain, and temporary cessation of all symptoms. This cycle of events, irritation, spasm, pain, and vomiting is what used to be called a *bilious attack* and is the direct result of disordered function, and occurs frequently in these persons. It may occur in normal individuals who are careless in their habits of eating and of attending to their bowels, but it is brought about more easily where there is visceroptosis.

Where the condition is recognized and given proper consideration the management of a case is comparatively simple, but the great danger is that the chronic symptoms and still more the acute attacks may be confused with inflammatory conditions of the gall-bladder or appendix, or elsewhere, and an operation performed, which, not only does not improve but which is very apt, by causing adhesions and weakening the muscle wall, to still further embarrass an already feebly-acting intestinal tract.

As I have said the diagnosis is made on the history, the physical examination and by the ruling out of organic disease.

The history, in the *hereditary type*, usually dates from childhood and in the *acquired type* from some definite cause, as a severe illness, pregnancy, etc., and the acute attacks are, as a rule, less severe and of shorter duration, than those the result of an inflammatory process. Recovery is also more rapid, there being prompt relief when vomiting takes place, the whole cycle lasting only a few hours, whereas in the inflammatory processes in addition to the localized pain and tenderness we have a much more gradual improvement and the persistence, often for several days, of more or less fever and leucocytosis.

On physical examination, there may be some slight distension of the abdomen, and evidence of an over-loaded colon, but no point of tenderness over the appendix, gall bladder or elsewhere. On the other hand there are the easily made out signs of ptosis of the abdominal viscera. If we can carry out laboratory tests and x-ray examinations during the chronic periods, certain other points of difference can be made out. In visceroptosis, the gastric analysis shows slight gastric stasis but no obstruction, varying with the degree of atony and dilatation present and normal or slightly lowered acidity. Under the fluoroscope, gastric peristaltic waves are seen to be small and weak and the barium meal shows nothing abnormal beyond the evidences of enteroptosis.

If we examine in the same way persons suffering from chronic disease of the duodenum, gall-bladder, or appendix, we can make out certain characteristic variations from the normal. Here we have a chronic source of irritation causing reflexly, through the vagus nerve, increased secretion and movement of the stomach. The gastric analysis shows that food leaves the stomach in less than normal time and that the gastric secretion is more acid and in larger quantity than normal, and, in addition to these findings, in ulcer cases we can frequently detect the presence of a small quantity of blood—that is, we have the stomach in a very irritable overacting state. The x-ray examination confirms these findings, the peristaltic waves are strong and frequent, and we can often see certain characteristic variations from the normal.

In duodenal ulcer we get changes in the normal outline of the first part of the duodenum, the result of adhesions, and in chronic, gall-bladder disease the pylorus is frequently drawn upwards and to the right as a result of chronic pericholecystitis. The x-ray findings in gastric ulcer cases are also wonderfully accurate. The ulcer itself can often be seen, and the characteristic spastic deformity which it causes, made out and recognized. Ulcer of the lesser curvature or body generally causes a circular, spastic contracture, whereas ulcer about the pylorus tends to cause pylorospasm. In this connection it is interesting to note that the hunger pain of duodenal ulcer is due to spasm of the pylorus and not to acidity, and that alkalis relieve pain, as can be seen by the fluoroscope, by causing cessation of movement and relaxation of the spasm. Further, that this cessation of movement is not due to an antacid action has been shown by Crohn, who, by withdrawing specimens of gastric secretion during fluoroscopic examination, found that we could have a high degree of acidity after taking alkalis and no pain where there was no spasm. Carlson has also shown that this same action can be brought about by using acids and alcohol instead of alkalis.

Just how valuable an aid we have in separating functional, and reflex conditions from organic disease of the stomach, is shown in a report of the x-ray department of the London hospital for 1921. A large number of cases were examined for possible gastric disease, and later were operated upon. In eighty-eight cases negative reports were given and in every one of these operation proved that the x-ray diagnosis was correct.

If then by using laboratory tests and x-ray examinations we can exclude organic disease, and if the history is lifelong and if the physical examination shows well marked signs of visceroptosis we should make our diagnosis and decide on appropriate treatment. This must be carefully planned and must last for many months.

By means of small amounts of easily digested food, by limiting the fluids, and by lying down after meals we may prevent overloading, and dragging. Carbohydrates should be used when possible as they leave the stomach more quickly than proteins or fat; liquids are best taken between meals. By daily exercises, such as bending movements of the thighs on the body, and by massage, we try to strengthen the supporting abdominal muscles and by regulating the habits and surroundings we try to avoid overfatigue and emotional disturbance. Where the abdominal muscles are small and weak, and particularly in elderly people, a well-fitting, abdominal belt should be used. That there should be regular daily bowel movements is essential as when this precaution is neglected, the *bilious attack* inevitably results.

That all these simple measures are helpful, every one of these patients will agree but the difficulty is to get them to carry them out indefinitely; they get tired of the routine and want to live as normal individuals. They hear of the brilliant results of surgery when dealing with organic lesions, so that, as Dr. Thomas Brown, of Baltimore, says, "there has arisen in the minds of most patients, many clinicians and not a few surgeons, the idea that the knife is the sole therapeutic agent of value in this field." The clinician knows that surgery will not cure their visceroptosis but after treating them with general measures for months. with little improvement and wishing to do all that can be done and hoping that the removal of a possible focus of infection in the appendix, gall-bladder, or bowel, or the fastening up of a kidney, stomach, or uterus, will cause improvement in their symptoms, he suggests or agrees to operation.

How little these hopes are realized we all know. Blackford, in 1921, studied the statistics of 1,000 cases seen by himself and his associates, who came complaining of gastric symptoms, and who were examined for gastro-intestinal disease. Only *fourteen per cent* of these showed gastric disease, while *twenty-five per cent.* belonged to a functional group diagnosed as chronic debility, asthenia, visceroptosis, neurasthenia, etc. (The others showed extra gastric abdominal disease or systemic disease.) Of the 1,000 cases, 202 had already been operated upon. One hundred and thirty had had their appendices removed and more than half of these stated that their symptoms were unchanged. These figures I think could be duplicated in any large centre, and we see how large is the proportion of persons complaining of gastric symptoms, who suffer from functional disease only; and we see how large a proportion of these are *not improved by operation.*

We all know of cases where gastro-enterostomy has been done and the symptoms have not improved. Sir Berkeley Moynihan in a paper entitled, "the disappointments after gastro-enterostomy," says, that one of the chief reasons why this operation so often does not give satisfactory results, is because it is frequently performed on persons suffering from functional disorders of the stomach or from disease elsewhere, as in the appendix, gall-bladder, etc. In the same paper he goes on to say that "done in a skilled manner in *appropriate conditions* there will be very few disappointments."

We must, therefore, remember that of patients complaining of gastric symptoms, about one quarter are suffering from functional trouble only; and that a large number of these functional troubles are due to visceroptosis, which condition can be benefitted by simple non-surgical treatment. If we should see a person with visceroptosis during one of the acute attacks, we must remember that the symptoms may arise from disordered function and not from inflammation, and that the proper treatment is—*to clear out the bowels.*

PREGNANCY AND HEART DISEASE*

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THE fitness of a woman for childbearing is a subject of the first importance which will frequently confront every general practitioner; to advise one that she is not fit is a great responsibility for any physician to assume. Our knowledge of the dangers involved in pregnancy for the woman suffering from tuberculosis, nephritis and certain other conditions is sufficiently definite to act as a guide, but in the case of the pregnant woman suffering from associated heart disease, this is not so. Sir James Mackenzie declares that, in spite of all the advances that have been made in our knowledge of the heart, there has been no improvement within the past fifty years in our attitude towards the pregnant woman suffering from heart disease or in our ability to properly advise her.

Believing that we should have in the records of the Montreal Maternity Hospital much material from which some information on this important subject might be obtained, this study was undertaken. The need for something in the way of a guide was forcibly brought to my attention when on November 24th, 1921, Miss J. W., about twenty-three years, came to consult me. For ten years to my knowledge she had had a well-defined mitral stenosis. One year before, as a result of overwork, she had had a slight attack of cardiac failure but this had yielded promptly to six weeks rest. Before and since she had had no symptoms referable to her heart. At the time of her breakdown the year before, I had advised her to shun young men, intimating that marriage and pregnancy were better avoided. But other counsels prevailed for she now came accompanied by her mother to request my permission for her immediate marriage. What was to be said? It would have been very easy to advise absolutely against the marriage with the likelihood that my advice would be disregarded and the responsibility shifted. This led me to a careful consideration of the proper advice to give under such circumstances, and to an investigation of the records of the Montreal Maternity Hospital from October, 1905, to the end of December, 1921, to obtain material on which to base any conclusions. During this period, there were 15,948 admissions, of whom 159 cases were stated to be suffering from associated heart conditions; practically one per cent. of the admissions. The reliability of the records from the point of view of cardiac diagnosis is satisfactory. The great majority of the cases prior to 1918, had been seen and examined by one of the senior physicians of the General or Royal Victoria Hospitals, since which date I have had the privilege of watching most of them. That there are some classified in the wrong group is probable and that there have been other cardiac cases admitted, more especially to the private wards, which did not show any resulting distress and were in consequence not recorded as such, is certain, but the margin of error is not great and does not, I think, vitiate our conclusions. In addition, a certain number of cases of heart disease which entered the hospital for rest and treatment because of a breakdown in the earlier months did not return for confinement: these are not included as they do not help to answer the question set before us.

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*Read before the Montreal Medico-Chirurgical Society, November 1st, 1922.

For the purpose of this study, the cases have been grouped as follows:

GROUP I.—Cases showing mitral stenosis.
" II.—Cases showing mitral regurgitation only.
" III.—Cases showing aortic regurgitation, with or without mitral regurgitation.
" IV.—Cases showing mitral stenosis and aortic regurgitation.
" V.—Cases showing auricular fibrillation.
" VI.—Cases showing myocarditis.
" VII.—A group of unusual and rare types of cardiac disease.

(1) *Cases Showing Mitral Stenosis.* This is by far the largest group. There are recorded sixty-seven labours by fifty-six women. Of the women, thirty-one were primiparae, of an average age of twenty-six years. Eighteen were pregnant for the second time; one was pregnant for the third time; one was pregnant for the fourth time; two were pregnant for the fifth time; four were pregnant for the sixth time; two were pregnant for the seventh time; two were pregnant for the eighth time; four were pregnant for the ninth time; two were pregnant for the tenth time. Four patients died in hospital (6%), one before delivery and three within a few days postpartum. In addition, five are known to have died within (about) twelve months after confinement as a result of heart failure. The children born of these women averaged between six and seven pounds at birth and seemed in every way as healthy as the average child, but ten of the sixty-nine children involved were sacrificed at the time of labour or died within a few days afterwards.

Although two of the four women who died were primiparae and another was having her second child, it is strikingly evident from a study of the case reports that the danger materially increases with each pregnancy: most of those coming in for confinement in their later pregnancies did so because of evidence of cardiac decompensation during its course; that they did not die was due to the care and judgment shown in the conduct of their cases. Undoubtedly many of these went out to a life of semi-invalidism; their hearts showed so much damage at the time of confinement that one could hope for no other result.

This disastrous effect of multiple pregnancies in this type of heart lesion is well illustrated by the history of Mrs. L. C. She came to the hospital when pregnant for the first time, in May, 1909 (No. 2,822). She gave a history of inflammatory rheumatism at the age of nine years and had a well-defined mitral stenosis present. On admission she was not in labour but was suffering from a mild grade of decompensation as evidenced by breathlessness, orthopnoea, some oedema of the ankles and precordial pain. Under rest in bed her condition improved rapidly and she went into labour three weeks later. Her delivery was rapid and normal with no evidence of cardiac distress. She left the hospital seventeen days postpartum in good condition. Four years later she returned (No. 7,156) with a history of three miscarriages in the interval. At this time she was six months pregnant and in labour and was delivered without any distress. She left the hospital eight days later in good condition except that some enlargement of her heart dulness was noted as compared with her previous admission. Eleven months later she was again admitted (No. 8,215) when seven and one-half months pregnant, with more evident signs of heart failure together with considerable albumen in the urine. She went into labour soon after admission and had a rapid easy delivery of a small premature infant which died within a few hours. Her fourth appearance was just five years later (ten years subsequent to her first pregnancy). She was admitted in a condition of grave decompensation with a history of two intervening miscarriages. She appeared to be then about seven and one-half months pregnant, had a blood pressure of $\frac{180}{100}$ and had marked albuminuria. Although kept in bed for ten days, her pulse remained constantly above 100, and it was decided that she could not be left alone with safety, so an induction was done, resulting in an easy, rapid delivery. During her puerperium, her pulse remained 120-130 and was weak and of small volume. She also developed postpartum a thrombosis of one of the mesenteric veins and of the left femoral vein and was transferred to the Royal Victoria Hospital (R.V.H. No. 31,633) where she went on to a definite gangrene of the left foot. After sufficient rest a Syme's amputation was done under spinal analgesia. After two months further stay, she was discharged showing considerable improvement in her heart condition but with very little vitality for a woman of thirty-two years of age.

As a group, cases with mitral stenosis during pregnancy have considerable distress due to dyspnoea and always require careful oversight, for they may at any time show symptoms demanding immediate interference. Decompensation is usually gradual and to be foreseen and relieved, but how tragically rapid may be its onset is evidenced by the history of one of our four fatal cases (No. 16,214). This patient had an old well-defined stenosis which had never given her any undue amount of distress. She was forty-two years of age and pregnant for the *ninth* time. She was being carefully watched by a thoroughly competent physician when suddenly in her thirty-sixth week, she began to suffer from breathlessness and inability to lie down. Her distress increased with alarming rapidity and thirty hours after the onset of symptoms she was removed to hospital where an immediate induction was done, without anaesthetic. Within a short time afterwards she became very cyanosed, and began to cough; respiration became very laboured, and both lungs rapidly filled with moist râles. Under oxygen she improved, labour pains began, the packing was removed and she appeared more comfortable. Four hours later she collapsed again and in spite of all that could be done, she died, just forty-eight hours after the onset of symptoms.

That this is not a usual sequence of events is evidenced by the fact that we have had only one other case at all parallel. This patient (S. M., No. 15,425) walked one-half mile to the outdoor clinic on a cold winter's day when six months pregnant. There she had a sudden collapse with acute cardiac failure, as evidenced by extreme dyspnoea, orthopnoea and cyanosis and, when examined by me one hour later, considerable oedema of the lungs. After eight days rest in bed she insisted on leaving hospital and did not return until labour began. She became pulseless after the birth of her child but finally left the hospital in fair condition. The other three cases who died were all brought into the hospital practically moribund and might, we feel, have been helped had the danger signals been known and recognized. (No. 1,273, No. 7,091, No. 15,609).

These signals, authoritatively given by Sir James MacKenzie, are entirely in accord with our findings: He says:

> "Evidences of heart failure are to be found not in the examination of the organ, but in the manner in which the circulation is maintained in the different organs of the body. While every organ of the body suffers when heart failure sets in, only a few organs produce recognizable signs. The organs which show the most distinctive signs of heart failure are the respiratory organs and the heart itself. In the case of both these organs, heart failure gives rise to distress; in the one case the distress is associated with breathlessness, in the other with pain of a definite kind in a definite locality."

Breathlessness is usually the earliest sign in cases of mitral stenosis. If there are found at the same time, persistent crepitations at the bases of the lungs, more especially if there is any dulness on percussion, the heart failure is definitely established.

Treatment. Close observation throughout pregnancy is essential, particularly for the early signs of cardiac failure. If all goes well beforehand, our records show that these cases stand the first stage of labour well but that the second stage is that in which the strain is put upon the heart and that as soon as the cervix is fully dilated, it is good practice to terminate labour, by the use of forceps or otherwise, as may be indicated. The danger of an anaesthetic does not seem as great here as in other surgical procedures. In nearly every case included in this paper, a moderate degree of anaesthesia was administered—usually chloroform—and in only one of the 159 was any alarming symptom attributed to it, and that case rapidly responded to stimulation. Should signs of decompensation occur in the earlier months, there is little likelihood that pregnancy can be allowed to go safely to term: whether it can be allowed to go along sufficiently to obtain a viable child is a question which must be decided in each individual case. One thing is certain; the heart will be permanently damaged.

As to the procedure when interference is needed, opinions differ considerably. Newell urges that all cases, where the patient's condition does not contraindicate it, should have an abdominal Caesarian section with sterilization at the same time; if the patient's condition does not warrant this an attempt should be made to restore compensation and then to empty the uterus. He urges the use of local analgesia plus morphine and scopolamine for section.

Our experience with such cases at the Maternity Hospital has been limited: only four in this group (No. 15,609, No. 2,417, No. 16,066, No. 13,528) were treated by Caesarian section while seven were aided by the more simple method of induction of labour. Of the four sections, one (No. 15,609) died of cardiac failure forty-eight hours postoperative, leaving a living child; one (No. 16,066) was operated on at the fifth month and sterilized, left the hospital in fair condition but died in the General Hospital two months later of heart failure; one (No. 2,417) who was well compensated at the time of labour did well and had a living child; the fourth (No. 13,528) was operated on because of a generally contracted pelvis and had a living child, compensation being at no time upset while in hospital or since.

Of the seven inductions, one died during labour, as already reported (No. 16,214); three were delivered successfully and had healthy children, while three were delivered successfully but lost their babies subsequently while in hospital.

To summarize the treatment of these sixty-seven cases: twenty-six (or 40%) had normal labours calling for no assistance and showing no unusual after-effects; sixteen were assisted by forceps; four underwent Caesarian section; seven had induction of labour; fourteen had various surgical procedures which the special circumstances of the case called for. The treatment of the heart condition was mainly by rest in bed, digitalis in the form of the tincture being the drug most commonly used when any further help was considered desirable.

(2) *Cases Showing Mitral Regurgitation.* There are twenty cases in this group. This seems small and out of proportion in over 15,000 cases, but, as a group, these cases give much less cause for anxiety and rarely break down, so that it is likely that a considerable number must have escaped attention, or at least the clinical recording of their disability. The almost invariable summary of the case report is, "Result good, mother and child." Of the twenty cases in this group, four were delivered by forceps, the other sixteen had normal labours. In none are there any notes or other indications that the heart gave any trouble, except that one (No. 2,037) was in hospital for one month's rest antepartum and was the only case (already mentioned) which collapsed under chloroform in the whole series.

(3) *Cases Showing Aortic Regurgitation.* (*With or without associated mitral regurgitation*). This group furnishes rather unexpected findings. There were so classified ten patients: only two showed any evidence of cardiac embarrassment during pregnancy. One of the two collapsed the second day postpartum, developing "acute dilation of the heart" (No. 1,807). She rapidly improved, however, and went out in good condition. She was next seen eighteen months later when she returned three months pregnant for a curettage and at this time her heart lesion was much less evident. Forceps were applied in but two cases: all the others were normal cases obstetrically and only one in addition to the one already described had, while in hospital, a pulse rate in any way out of the ordinary. Moreover, in contradistinction to the cases of mitral stenosis, those coming in for later pregnancies did not show any proportionate disturbance of the heart.

(4) *Cases Showing Aortic Regurgitation and Mitral Stenosis.* This group is small (seven cases) but sufficiently large to indicate that these cases *always* warrant a grave prognosis. Of the seven cases reported, only one had a normal labour (No. 7,040). This one had had some decompensation antepartum but her labour was so rapid and easy that the baby arrived before she could be removed from the ward to the caseroom. All the others needed assistance; one was delivered by Caesarian section, and all were permanently damaged, we consider, as far as their hearts were concerned, by their pregnancy. This opinion is supported by the condition of the only one since seen. She is to-day in hospital again and now has auricular fibrillation and is only awaiting sufficient improvement to have an induction of labour done (No. 7,146, No. 7,178).

(5) *Cases Showing Auricular Fibrillation.* This group, although small, indicates the gravity of pregnancy where fibrillation is present. Most of these cases gave indications that stenosis of the mitral valve had preceded the irregularity. There are ten cases in this group: seven pregnant for the first time, one for the second, one for the fourth and one for the twelfth. Not a single case was normal throughout. Three had normal rapid labours but showed heart failure during the puerperium, five had forceps deliveries, one a version and extraction and one died undelivered sixteen hours after admission to hospital, having been brought in with acute oedema of the lungs, orthopnoea, cyanosis and thrombosis of the left brachial vein (No. 9,245). A second case died on the tenth day postpartum of heart failure: she was admitted in very poor condition and never improved in spite of the liberal use of digitalis. Of the other eight, all but three gave indications at the time of discharge, or subsequently, that their hearts were very gravely damaged and it is very doubtful whether any of them could go through another pregnancy successfully.

(6) *Cases of Myocarditis.* As used here, the term implies cases showing a defective response to effort, in whom endocarditis or pericarditis could be excluded as a cause. This group contains twenty-eight cases and it shares with fibrillation the doubtful privilege of being ranked as the most dangerous cardiac complication of

pregnancy. Of the twenty-eight cases, twelve were pregnant for the first time; eight were pregnant for the second time; three were pregnant for the third time; one was pregnant for the fourth time; one was pregnant for the fifth time; one was pregnant for the sixth time; one was pregnant for the eleventh time; one was pregnant for the fourteenth time. Seven of the twenty-eight (25%) died as a direct result of the pregnancy while others are known to have succumbed subsequently. Of the deaths, one (No. 11,248), a primipara, entered the hospital with marked heart failure and under the influence of alcohol. Low forceps were applied at the end of the first stage but the pulse, which was 148 on admission, remained very fast and the patient's heart simply gave out, with death nine hours postpartum. A second alcoholic (No. 2,095) came in for her fourteenth pregnancy with signs of decompensation and a constantly rapid pulse (120+). She had a normal, rapid labour, but had difficulty in the third stage due to a retained placenta. Sudden death occurred on its manual removal; the death, however, appeared to be due to cardiac failure and not to haemorrhage. A third case (No. 11,924), a primipara of twenty-eight, was in a moribund condition when referred to the hospital. A Caesarian section was done in an attempt (successful) to at least save the infant's life. The others died four days, five days, ten days and eleven days postpartum, with signs of increasing exhaustion of the heart muscle.

In this group the striking feature of the case reports is the evidence that it is the pregnancy rather than the labour that does the damage. Fourteen of the cases were multiparae with rapid easy labours, yet all showed a tendency to collapse afterwards. Moreover, those whom we had an opportunity to watch antepartum showed evidence of deficient cardiac response, as indicated by a constantly rapid pulse, breathlessness, etc. As already mentioned, fourteen had rapid easy labours; seven were assisted by forceps, (including two in whom an induction was done); three had version and extraction performed; and four had Caesarian sections.

One of the Caesarian sections was the case moribund on admission already dealt with: the other three were operated on for pelvic obstruction in spite of, not because of, the heart condition. One was for a flat pelvis, one for a large fibroid and one for an associated carcinoma of the rectum. The last died four days after operation, the others did well.

The histories of two cases illustrate the danger of allowing pregnancy to take its course in this group while awaiting evidence of *serious* breakdown. In this it is in contrast to Group 1 with mitral stenosis.

The first case came to hospital when six months pregnant in a very grave state of heart failure, as evidenced by marked cyanosis, dyspnoea and oedema of the limbs. She was thirty-two years of age and pregnant for the second time (No. 8,021). She was immediately taken in hand, given all the help possible, but five days later died undelivered, having failed to respond in the least to any treatment.

The second, a young woman of twenty-two, second pregnancy, came to see me when ten weeks pregnant, having returned to Montreal because of breathlessness, palpitation and precordial pain. Her pulse was 140 and she looked very ill. She was immediately seen by a member of the staff of the hospital and her uterus emptied the same week, with a very immediate improvement in her pulse and symptoms. The procedure in this case was justified by subsequent events. She developed acute inflammatory rheumatism four months later while on a visit to Quebec, and died of heart failure within one week of its onset It seems hardly possible that had her pregnancy been allowed to proceed, she would have been able to survive it.

(7) A small group of cases with *unusual cardiac defects* is of more interest than importance. It includes two cases of congenital heart lesions and five cases which have been classified in the records as aortic stenosis.

The first of the congenital cases (No. 2,579) was immediately admitted for observation when she applied at the outdoor. She had an appearance typical of a case of pulmonary stenosis: marked cyanosis, clubbing of the fingers, etc., and a rough rasping murmur over the pulmonary cartilage. She gave a history of two deadborn babies. While under observation, as well as at the time of labour, she showed no signs of cardiac distress. An induction with version and extraction was done, chiefly because of the loss of her previous children and to make certain of a living child. The second one (No. 5,934), a primipara of twenty-five years of age with a similar lesion, was first seen three weeks before confinement. At that time the following note was made on her preliminary history sheet, "There is a systolic murmur present at the base due to a congenital condition and it is not thought that it will be affected by nor affect labour." Subsequent events proved the prognosis to be correct, for she had a normal easy labour without any apparent effect on the heart.

That we should have five classed as *aortic stenosis* in a series of 159 cases is out of all proportion, but the diagnosis in every case was made by one of our senior physicians. The explanation is to be found, I think, in the very rarity and the obtrusiveness of the lesion: when the patient presented herself to the practitioner, he referred her to hospital because of his uncertainty as to the outcome. That aortic stenosis is not to be dreaded from the obstetrical point of view seems clear from our cases. The first was twenty-five years of age and pregnant for the second time (No. 1,750). She showed no distress before or during labour. The second (No. 3,010) was forty years of age and pregnant for the seventh time. Although there was some dyspnoea which caused her to be sent in antepartum, she did well and left the hospital in good condition on the fourteenth day. The third (No. 2,110) like the second was forty years of age and pregnant for the seventh time and was sent in antepartum for early signs of cardiac failure. She also did well. The fourth (No. 1,458) was pregnant for the ninth time. All her previous labours had been normal. On admission she was in a condition of broken compensation with evidence that the myocardium was involved. After five weeks rest in bed an induction was done and a small child was removed by forceps. There was rapid improvement after her labour but she broke down again a few days after she left the hospital and she died in the General Hospital one month postpartum, as a result of the associated myocarditis. The fifth case (No. 7,084) thirty-two years of age, pregnant for the second time, also had an associated myocarditis. She had previously been under observation in the Royal Victoria Hospital. She had a normal easy labour but collapsed at the end of the third stage; she responded rapidly to stimulation and left the hospital in fair condition two weeks later. These five women with aortic stenosis had twenty-seven children and it was only when the myocardium became affected by multiple pregnancies that any disturbance resulted.

The following conclusions appear justifiable from a study of these cases.

(1) Certain heart conditions are very adversely affected by pregnancy and it constitutes for them a very real complication. Included in this group are auricular fibrillation, myocarditis and mitral stenosis.

(2) Marriage and pregnancy are not justifiable in cases of auricular fibrillation or myocarditis as here defined.

(3) Should any woman after marriage develop either of these conditions and subsequently become pregnant, she should be aborted and sterilized without awaiting signs of breakdown.

(4) Cases of mitral stenosis with no evidence of myocarditis or of previous heart failure are capable of bearing one or two children with safety if carefully watched, but each pregnancy damages the mother's heart very considerably.

(5) With close attention to the signs and symptoms of heart failure as evidenced by breathlessness, palpitation, precordial pain and râles at the bases of the lungs, one can forestall a breakdown in cases of mitral stenosis by interference, either by induction or by section, according as the special case may indicate.

(6) Unless specially indicated, abdominal Caesarian section is not as satisfactory a method in cases already showing some heart failure as induction of labour or vaginal section, leaving the sterilization of the patient to some subsequent occasion.

(7) Certain other heart conditions are not much affected by pregnancy and there is no need to advise against marriage on account of the lesion itself. This group includes mitral regurgitation, aortic regurgitation, aortic stenosis and the congenital lesions.

(8) Finally, it is evident that it is the *heart muscle* that is the factor of importance and that all other factors are of consequence only in so far as they may involve it.

Fatal Infections Following Tonsillectomy—Two cases of generalized infection following tonsillectomy are described by I. Harrison Tumpeer and Abraham Levinson, Chicago (*Jour. A. M. A.*, Jan. 6, 1923), one a septicemia, the other a meningitis, both due to strains of pneumococcus.—*Jour. Am. Med. Ass.*, Jan. 27. 1923.

UNUSUAL CONTENTS OF OVARIAN CYSTS—REPORT OF TWO CASES

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Many instances of the surprising contents of dermoids of the ovary are to be found in the literature. Bland-Sutton in his book "Tumours, Innocent and Malignant," says that, in addition to the semi-solid, greasy substance filling the cyst cavity, each cyst contains an embryonal rudiment usually in the form of a nipple-like process. This "pseudo-mamma," as he terms it, is covered by lumps of fat, though some contain glands and ducts which furnish a milky fluid, and in one case he mentions the ovarian mamma had an areola and glandular tissue like a normal mamma. Epidermis may be present round this area and sometimes pigment. The shed epithelium and fat may fill the cyst with hundreds, or even thousands, of small, round, pill-like epithelial balls, a fact illustrated by a recent case in this hospital. Hair, sebaceous glands, sweat glands, bones, teeth and nerve tissue are common findings, and in one case at least a structure resembling an eye was present. As early as 1893 Bland Sutton found thyroid gland tissue and since then others have reported similar cases. Of the two cases which form the subject of this article the first resembles the case of Bland-Sutton's in that thyroid tissue was present, while the second showed traces of another organ which does not appear to have been previously reported.

Case I.—Married female, age 61, entered Winnipeg General Hospital November 12th, 1918, complaining of abdominal distress and enlargement and loss of sixty pounds in weight during the previous six months. Her past history was uneventful. The menopause occurred when she was fifty. Her present illness began eleven months previously when she had a uterine haemorrhage. This was the only time she noticed any bleeding For the last six months she had been conscious of soreness in the lower abdomen accompanied by loss of weight and progressive abdominal enlargement which had caused considerable distress in the upper abdomen. Physical examination was negative except for the abdomen which was markedly distended, contained fluid, but was not tender. Percussion gave a dull note over the lower half of the abdomen. Pelvic examination showed a tumour the size of a foetal head on the right side of the uterus.

The day after admission (Nov. 13th) twelve pints of clear, light yellow fluid were aspirated from the abdomen. Examination of this fluid showed it had a specific gravity of 1,010, albumen 5%, and contained a large number of lymphocytes.

At operation on November 16th a large right ovarian tumour, approximately 12 x 9 x 8 cms. adherent to the large bowel was removed. The surgeon's notes at that time were that the tumour was very firm and nodular and probably malignant.

The interesting points clinically were: (1) The lateness of the symptoms (age 61, eleven years after menopause); (2) Large tumour; (3) Simulation of malignancy; (a) Uterine haemorrhage; (b) Irregular and nodular tumour; (c) Free abdominal fluid; (d) Marked loss of weight.

Pathological examination showed a dermoid cyst and no evidence of malignancy. Microscopically the tumour was firm, greyish-white in colour, and roughly spherical over three-quarters of its surface, the fourth quarter being irregular and possessing two well marked nodular projections, one much larger than the other. On cutting the tumour in half the part which looked spherical from the outside was seen to consist of a round encapsulated mass of the usual greasy material containing hair and teeth, and on top of this, and separated from it by a fibrous capsule, was a darker body, mottled, greyish in parts, reddish in others, broken into lobules by fibrous strands, and looking like thyroid tissue.

Microscopically this area showed large and small well-formed acini lined by cuboidal epithelium with deeply stained nuclei, all containing colloid material. Some of the acini were dilated and in these the lining cells were somewhat flattened. The interstitial tissue was well marked, stained well, and here and there showed some collections of round cells. In all the slide had the appearance of a typical normal thyroid.

Case II.—A married female, age 35, was admitted to Winnipeg General Hospital January

12th, 1922, complaining of discomfort on the right side. She had had four children (youngest, three years old) labours all being normal. There were no miscarriages. Her present trouble began four years ago when she first began to feel discomfort on her right side. She consulted a surgeon who suggested the appendix might be the cause and advised operation, which she refused. Soon after this she became pregnant, and had a normal delivery. Since then the discomfort had gradually increased but there was no menstrual disturbance, though the discomfort was worse at the menstrual period.

Physical examination showed only slight tenderness on pressure over the right lower abdomen. Pelvic examination revealed a mass on right side of pelvis, fairly movable, and firmer than the usual ovarian cyst. At operation on January 14th, 1922, a right-sided ovarian tumour was removed. There were no adhesions and the left tube and ovary appeared normal. Since the operation the discomfort has gone and the patient has been quite healthy.

Pathological examination showed the tumour, which was the size of a full-term foetal head, to be a dermoid cyst, containing three teeth, strands of hair, a papillary skin projection, and the usual greasy or buttery substance. In the wall of one side of the tumour was an elevated triangular nodule about three-quarters of an inch high and one and a half inches at the base. On cutting into this nodule a small triangular area, deep yellow in colour, resembling adrenal cortex, with an adjacent very thin dark streak was found.

Microscopic section of this part showed cells very like those of the cortical layer of the adrenal gland, a definite capsule of smooth muscle fibres, a somewhat indefinite zona glomerulosa but a quite definite zona fasciculata of round or cuboidal cells containing a deeply staining nucleus, granules and fat vacuoles, but with no basement membrane. Some of these cells contained dark brown pigment and in this area there were fewer fat vacuoles.

A small piece of this tissue was submitted to Professor A. T. Cameron, Professor of Biochemistry at the University of Manitoba, for chemical analysis, and his report is shown below.

Report on Adrenine Content of Sample of Tissue of a Dermoid Cyst.—"The adrenine was estimated by the colourimetric method of Folin, Cannon, and Denis (*J. Biol. Chem.*, 1913, *13*, 477), depending on the development of a blue colour with Folin's phosphotungstic reagent.

This was tested for very small amounts of tissue with the following results:

(1) A dried sample of whole adrenal gland, known to be active:

0.038 gm. contained.........0.7% adrenine
0.0005 gm. contained........1.3% adrenine

(2) A fresh adrenal gland, human, received from autopsy January 20th. This was separated into medulla and cortex as far as possible, but since cross-sections were very thin for both it was not easy to make a complete separation The cortex contained a trace of medulla, and the medulla-portion consisted of perhaps a third of cortex. Both portions were dried over sulphuric acid, and the dry tissue analyzed.

I. "Medulla,"..0.0423 gm. contained, 0.95 % adrenine
0.0009 gm. contained, 1.4 % adrenine
II. "Cortex,"...0.063 gm. contained, 0.047% adrenine

With the method as employed, warming with 0.1 to 1.0 c.c. N10 HCl in a centrifuge tube, extraction of the larger amounts was probably incomplete, and accounts in part for the differences obtained. The small amount of adrenine found in the cortex material was at any rate largely due to the trace of adherent medulla.

The dermoid cyst tissue appeared to consist of adrenal, chiefly yellow cortex, with a small dark streak of what appeared to be medulla. It was received in a partially hardened condition. The "medulla" portion was separated with as little "cortex" as possible, but contained only 20 to 30 per cent. of "medulla," (sample I). A similar amount of cortex material was taken (sample II). These were weighed and dried over sulphuric acid. The remaining tissue consisting of "cortex" and three or four times as much non-adrenal tissue, adjacent, was air-dried (sample III). For comparison some non-adrenal tissue was taken from the same cyst (sample IV), and this was tested fresh.

Sample	*Material*	*Weight*			*Adrenine*
		Fresh gm.	*Dry gm.*	*mg.*	*% dry tissue*
I	"Medulla" ("cortex")........	0.0011	0.0007	nil	..
II	"Cortex".........	0.0014	0.0005	0.0013	0.26
III	"Cortex" adjacent tissue........	..	0.0105	0.002	0.02
IV	Non-adrenal tissue.	0.1	..	nil	less than 0.001

Though uric acid and other substances also give the blue colour with Folin's reagent, Folin, Cannon, and Denis consider that the amounts of such substances present in blood and tissues are not sufficient to interfere with the estimation of adrenine, and it seems unlikely that they would be detectable with the small amounts of tissue in samples I and II. The results strongly suggest the presence of a trace of adrenine in the supposed 'cortex" tissue, but the absence of adrenine in sample I (which gave no trace of blue colour with the reagent) cannot be explained.

Fenger (*J. Biol. Chem.*, 1912, *II*, 489: *12*, 55) has shown that the foetal adrenal (cattle, sheep, hogs) contains adrenine to the extent of two to four per cent. of the desiccated, fat-free, gland, the amounts being usually somewhat greater than in the glands of young animals."

For these two interesting cases I am indebted to Dr. N. J. MacLean and Dr. Wm. Chestnut for the clinical material, and to Professors Wm. Boyd and A. T. Cameron for help with the pathological and chemical sides respectively.

MATERNAL MORTALITY*

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When we take into consideration the advances that have been made in preventive medicine and in the education of the public in all matters pertaining to the health of the community at large, with the result that the man of to-day is supposed to have ten years more of life than the man of a century ago, we are inclined to feel pride in the profession which has been able to add to man's allotted time of three score years and ten, and to take, each of us to himself, some of the credit for this change. But when we examine the vital statistics of the community and find that the number of deaths directly or indirectly attributable to child-birth is second only to that of tuberculosis during the reproductive years, we are compelled to pause and take stock of ourselves in order to determine wherein the fault lies, and why these things should be.

In connection with the question of maternal mortality I have made an analysis of the cases that have died in the Burnside Hospital during the period 1914-1922. Patients admitted to this hospital are of three classes, *viz.*, those attending the prenatal clinic, who are kept under supervision throughout the course of their pregnancy; those sent in from outside during labour, or before, when some crisis such as rapidly developing toxaemia, eclampsia, malposition, obstructed labour, placenta praevia, etc., has arisen; and thirdly, a considerable number of semi-private cases, the vast majority of whom have shown signs pointing to an abnormal labour which requires the facilities of a hospital. Severe cases of early vomiting of pregnancy and cases of abortion are not included, these being admitted to the gynecological wards.

The number of cases admitted from July 29th, 1914, until October 26th, 1922, was 6,982. Of these eighty-six died, giving a mortality of 1.24%.

Year	*Deliveries*	*Deaths*	*Mortality Percentage*
1914 (5½ months)	535	4	.747
1915............	707	4	.565
1916............	647	8	1.236
1917............	741	9	1.214
1918............	867	16	1.845
1919............	863	17	1.962
1920............	1,128	12	1.063
1921............	842	9	1.068
1922 (10 months)	652	7	1.073

The causes of death were as follows:

Accidental Haemorrhage—2 deaths, one following Caesarean section.

Placenta Praevia—4 deaths. In three of these a version was performed and in one high forceps were used.

Post Partum Haemorrhage—2 deaths.

Ruptured Uterus—6 deaths. One of these was spontaneous. One was in a case following high amputation of the cervix; one followed a difficult labour in which a craniotomy was performed; the remaining three followed an attempt at version.

Shock—5 deaths. One of these was due to an attempt at forceps delivery through an undilated cervix in a case of placenta praevia. In the remaining four craniotomy was performed following repeated attempts at delivery, one of them being a case of hydrocephalus.

Caesarean Section—8 deaths. One of these died of post-partum haemorrhage; three were operated on after previous attempts at delivery; two died of ileus and two of peritonitis.

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*Read at Stated Meeting, Academy of Medicine Toronto, on December 5th, 1922.

Eclampsia—19 deaths. Of these one was dead on admission; one had pneumonia; two were twin pregnancies; two died before delivery; Caesarean section was performed on four and one developed hemiplegia post partum. The remaining eight were treated with morphine, four being induced and delivered by forceps, the remaining four going into labour spontaneously. It is worthy of note that not one of these cases of eclampsia came from those attending the prenatal clinic.

Pneumonia—17 deaths. One of these was a lobar pneumonia; the remaining sixteen were cases of pneumonia complicating influenza during the epidemic of 1918.

Septicaemia—8 deaths. Four of these were cases of spontaneous delivery, one of which had a perineal laceration. Four were forceps deliveries, one after manual dilatation of the cervix with laceration, a second having a craniotomy done after many attempts at delivery; the third a mid-forceps, and the fourth a low forceps delivery.

Perineal Cellulitis—1 death, following a forceps delivery.

Peritonitis—2 deaths, each following the rupture of a tubo-ovarian abscess.

Appendicitis—1 death, in a mother six months pregnant.

Pulmonary Embolus—4 deaths. One of these developed a high fever following a difficult labour. The other three had no elevation of temperature post partum.

Tuberculosis—2 deaths. One was a case of acute miliary tuberculosis, four months pregnant. The second was a case of tuberculous kidney, five months pregnant, in which a vaginal section was performed.

Mitral Stenosis—2 deaths. One was a case of twin pregnancy. Forceps were used in both cases.

Ulcerative Endocarditis—2 deaths, one post partum.

Aortic Aneurism—1 death, five days post partum.

These figures cover a period of over eight years and the mortality percentage is appallingly large. Consideration of the results leads one to the inevitable conclusion that in many cases there have been lack of supervision during gestation, careless preliminary examinations or none at all, ill-timed and meddlesome interference, imperfect technique and an unrecognized disproportion between mother and child.

Eclampsia comes under the head of preventable diseases. It is worthy of note that among the nineteen deaths from eclampsia in this series not a single one of these occurred among cases in attendance at the prenatal clinics. The value of the clinics cannot be overestimated, and the saving of a single life that might otherwise be lost justifies the establishment of such a clinic anywhere. The expectant mother comes there and is given a complete physical examination, has her pelvic measurements taken, urine examined, blood pressure noted, is instructed concerning clothing, diet, exercise, personal hygiene, told to report regularly for examination and also whenever anything abnormal affects her, and she leaves the clinic with a sense of security, confident that she is being cared for during this critical period of her life. The social service nurses keep in touch with her and instruct her in the duties and responsibilities of young motherhood and impress on her the necessity of regular attendance at the clinic. That the patients appreciate this constant care and oversight is evidenced by the ever increasing size of the prenatal clinics.

Since the establishment of the Burnside clinic many cases of commencing toxaemia have been discovered, sent into hospital and have received appropriate treatment, with the result that the mortality in this particular complication has been reduced to nil. This is a striking commentary on the value of the prenatal clinic. It entails cooperation between patient and physician, education of the expectant mother and painstaking and sympathetic supervision on the part of the doctor.

The routine of the prenatal clinic can just as easily be carried out in private practice. The busy practitioner, however, lulled to a sense of false security by a long series of successful deliveries, relaxes his vigilance and passes hastily over specimens of urine sent for examination, or omits his routine examination of his patient and thus misses the premonitory warning of a threatened toxaemia.

Septicaemia also comes under the class of preventable diseases. All puerperal infections are wound infections. The interior of the puerperal uterus is a huge bleeding wound, which, together with lacerations of the genital tract, gives an open road for the entrance of invading organisms to the blood stream or the lymphatics. Yet in spite of this, many a hardy practitioner on the completion of the third stage, without any preliminary sterilization thrusts his ungloved hand into the uterus to clear out the clots and see that nothing is left within. When warned of the danger of sepsis he smiles benignly and tells of hundreds of cases treated thus with not a single failure. Such a man is more fortunate than he deserves, for success in obstetrics never justifies faulty technique. Sooner or later his failure will come and the loss of a single life should forever condemn a practice which is fundamentally dangerous and unsound.

Many cases of ruptured uterus and death from shock occur through failure to recognize in time abnormalities in the birth canal and disproportion between mother and child, as well as from the desperate and unskilled efforts of the practitioner to overcome insurmountable difficulties in delivery.

In maternal mortality the two main factors to be considered are the doctor and the mother. The work of the former and the education of the latter are of vital importance to the life of the community, and every doctor should be an educator. If he is not able or willing to turn his consulting room into an antenatal clinic and to devote the same consideration and skill to the management of pregnancy and the conduct of labour as he does to a surgical case, then he should be prepared to give up the practice of obstetrics. If, on the other hand, he comes to realize his responsibility for the care of the expectant mother and her child he will do much towards the preservation of a healthy motherhood and the building up of a healthy nation.

Much, too, can be done towards the education of the mother by establishing prenatal clinics throughout the city. Just as there has been brought about a remarkable improvement in infant mortality through welfare clinics in this city, so can a corresponding lowering of maternal mortality be accomplished by antenatal clinics. Of the former there are now twenty-three, and of the latter only four outside of the hospitals. These clinics should work hand in hand and wherever a welfare clinic is established there should also be a prenatal clinic, for while it is of the greatest importance to keep the well baby well, it is just as important to keep the expectant mother healthy.

Postnatal care is as important and necessary as prenatal care. Much damage is done through neglect during the puerperium and many women enter into a period of long invalidism which might be avoided through the exercise of proper care and attention at and after childbirth. Here the clinic is of value, inasmuch as the patient is kept under supervision until involution is complete, and is instructed as to the treatment necessary to restore her to health.

The public is as a rule conservative in regard to education along lines of health. So much benefit, however, has been derived from the publicity given to tuberculosis, child welfare, social hygiene, etc., that women generally will appreciate the value of prenatal care, and will demand that care when the necessity for it is impressed on them by the doctors, the nurses, the social service workers and the department of public health.

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77. **Association of Bladder Symptoms with Ultra-Descent of the Right Testicle.**—A. Adler (*Deut. med. Woch.*, December 1st, 1922, p. 1612) has tested Ebstein's claims as to the diagnostic significance of the degree of descent of the testicles. Having many patients in hospital suffering from enuresis or other slight nervous disorders of the bladder, the author compared the incidence of these symptoms with that of ultra-descent of the right testicle. The coincidence of the two phenomena proved to be remarkably frequent, and when a patient was found to have ultra-descent of the right testicle he often gave a history of nocturnal enuresis. The author has collected 22 cases of ultra-descent of the right testicle, and he gives details of 12. Only in 4 out of the 22 did he fail to correlate the ultra-descent of the right testicle with functional disturbances of the bladder. He assumes that the ultra-descent of the right testicle betrays a slight functional deficiency in the lower segments of the cord; the right testicle hangs lower than the left because the tone of the right cremaster muscle is defective; and the low position of the right testicle is not the cause of the bladder symptoms, but merely, like them, the result of a defect in the nervous system.—*Brit. Med. Jour.*

PYELITIS*

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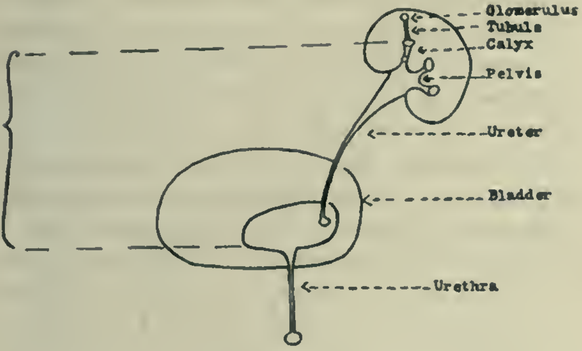
FROM a surgeon's point of view, the arbor urinae consists of a series of funnels from glomeruli to meatus, all flushed throughout life, more or less constantly, with urine propelled by the *vis a tergo* of excretion through the kidney itself and the calyces, by peristalsis through the ureters, and intermittently, by voluntary contraction of the bladder and relaxation of its sphincters, down the urethra through which it is finally voided. In case of infection, so long as these funnels are unclogged and urinary antiseptics are administered, we have here, without incision, an open suppuration and a Carrel-Dakin system of irrigation most useful in curing the infection. Schematically it may be presented thus:—



The glomeruli and urinary tubules, the highest of this series of funnels, are lined with cubical and columnar epithelium through which pass bacteria which have gained access to the circulation from a primary focus elsewhere in the body. Some say no normal kidney will excrete these, but this is an academic point of no practical value, for one may assume that any kidney called on to excrete them is already affected by their toxines circulating with them in the blood. In bacilluria there is a minimum amount of reaction to their presence as manifested by the almost complete absence of polymorphonucelears and the bacilli thrive on the proteins in the urine. In pyuria they have obtained a foothold in the living tissue of some part of the urinary tract and their invasion and the defense against it is manifest by the presence of dead or dying bacilli and polymorphonucelears and other debris constituting "pus," which is washed down by our Carrel-Dakin system of irrigation. Just why we have bacilluria at one time and pyuria at another will be referred to, if not fully explained, later.

The next series of funnels are the calyces, pelves, ureter, and bladder part of the lowest funnel. These are lined with transitional pavement epithelium, a protective epithelium very different in function from the renal epithelium above described. It is more like the squamous epithelium of the skin of the body which, while unbroken, saves us from infections of all kinds. Conceivably, however, it is less vulnerable even than this, for it contains no sweat or sudoriparous glands and no hair follicles. Albarran found the bladder, ureter and renal pelvis immune to simple injection of almost all forms of pathological bacteria and his work has been confirmed again and again.

We have now only the tube part of the last funnel to consider, the flare of this funnel—the bladder—already having been taken up. The pavement of the urethra is broken by the cubical epithelium of the glands of Littré which open into it throughout its entire length and may explain why this part of the urinary tract is so vulnerable. These may be open, or partially open doors, sally ports, as it were, from which polymorphonucelears emerge more easily against gonococci deposited in the urethra. Whatever the explanation may be, we know the urethra falls an easy prey to gonococci, and very probably it is the antrum of infection for tubercle bacilli as well; for recently many cases of coincident genital tuberculosis in husband and wife have been reported and Prof. Blandini has experimentally produced tuberculous perinephritis by inoculating guinea pigs in the urethra with tubercle bacilli.

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Before taking up the sources of infection and the routes by which it travels to the urinary tract, it will be profitable to consider some of the known peculiarities of infecting agents.

D. W. MacKenzie reports that some member or members of the colon bacillus family are present in 95% of pyelitides, which is a large enough proportion on which to found a rule, and to consider all other infections of the renal pelvis as exceptions; and that is what we purpose doing here, referring hereafter to the colon bacillus family as "C. B."

C. B. are motile, and in bacilluria, by moving in shoals, give the urine the characteristic appearance of glinting, like shot silk. Being nearly of the same specific gravity as urine and motile it is difficult to drive them to the bottom of a centrifuge (except such as become entangled in pus) so that the urine remains opaque to centrifugation, also to acids and to heat. C. B. are saprophytes in the intestine and easily kept in their place by an unbroken epithelium; but when the bars are down they press through, change their mode of life for a roaming pathological one; set up mild infections *in loco*, whence they take to the blood or lymph stream bound for distant parts and tend to be extruded through the kidney. If circumstances render the kidney non-resistant, or if the C. B. are particularly virulent, pyuria results. Contrariwise C. B. may be forced once more to the life of a saprophyte, to live on the protein matters of the urine in bacilluria. In any case, once it is in the kidney, its motility, and the urinary stream in which it can swim in the tubules, seems to save it from being walled off into cortical abscesses, which is often the destiny, as we shall see, of non-motile bacteria. As a saprophyte in the urine it feeds, not only on the normal urine proteins, but Rovsing says the eroded appearance of some calculi is due to the activities of C. B. in the albuminous matrix of these calculi. C. B. prefer a neutral medium, but large doses of sodium or potash, although they relieve the symptoms of pyelitis, do not kill the micro-organism, (Thompson Walker). If the urine is rendered very acid by the exhibition of phosphoric acid, a coincident improvement in the symptoms of pyelitis takes place. C. B. may pass for years over the urethral and bladder epithelium without infecting it, but in such cases the urethra is not equally exempt.

Akin to C. B. is the Bacillus Typhosus, to which is frequently due a pyelitis during typhoid fever. If it persists the host is known as a "typhoid carrier."

In earlier days one heard much of the peculiarly vicious bacillus proteus of Hauser. Albarran found it the only micro-organism which would set up inflammatory reaction in a normal bladder. It was taught that it broke up urea in the urine, freeing ammonia which excoriated the bladder epithelium, that ammonia also united with magnesium phosphate to form triple-phosphate crystals (which are also an excoriant of the bladder epithelium), and that carbamic acid, coincidentally freed from urea by the B. proteus, united with calcium to form calcium carbonate, which with triple phosphates and the product of cell destruction by ammonia for matrix, formed secondary calculi. Either the B. proteus is not so great a villain as painted, or he is rarely met with. I recall his being reported once by the pathologist, and then the urine was not even alkaline, but acid.

The micro-organism usually found with the attributes ascribed to the proteus, is the staphylococcus albus, which is a saprophyte in normal urethra, and by some considered identical with the staphylococcus urethra. Other cocci occasionally found in pyelitis are the staphylococcus aureus and citreus. Gonococci may cause pyelitis more frequently than is supposed. It is probable that inflammation of the lymph glands at the hilum of the kidney (amongst others) very often prevents the spread of gonorrhoea to the general system, and the wonder is that these glands are not frequently overwhelmed, suppurate and burst into the renal pelvis.

The tubercle bacillus does not form pus but is sociably inclined, and usually consorts with pyogenic bacteria. When tuberculosis of the kidney is seen as a focus confined to the medulla the micro-organism has probably arrived by lymph stream to the same lot of glands at the renal hilum as mentioned under gonorrhoea. The accompanying pyogenic micro-organisms set up suppuration which evacuates into the renal pelvis causing pyelitis, and one should always bear in mind that pyelitis never excludes tuberculosis. The peculiarity of the tubercle bacillus, or of it and its associates, is that, with time, secondary tubercles appear in the bladder where the urinary stream from the ureter impinges on it, and yet we cannot experimentally by contact alone, produce a cystitis with any micro-organism but the proteus bacillus.

THE SOURCES, ROUTES, SECONDARY FOCI, ETC. OF MICRO-ORGANISMS IN THEIR RELATION TO PYELITIS

Inspired by Prof. Blandini, or at least acknowledging his priority in the field of experiment on lymphatics of the urinary tract, Kenneth Macfarlane Walker has shown that colored granules and micro-organisms inoculated in the broken epithelium of the urethra of guinea pigs, travel by at least one route to the upper end of the ureters in 12 hours. This route is composed of the peri-urethral, subtrigonal and peri-ureteral lymphatic vessels. At the upper end of the ureters, at their junction with the kidneys, lie a series of lymph glands described by Cuneo and Poirrier, singularly enough not referred to by Walker. A gonorrhoeal, tuberculous, C. B., or other infection carried to these glands in overwhelming numbers or virulence, will cause suppurative adenitis which on rupture into the renal pelvis will cause pyelitis by direct extension. Walker also traced lymphatic currents from the upper end of the ureters over the dorsum of the kidney in the true capsule, and from the true capsule he found the currents ran between the glomeruli and tubules toward the renal pelvis carrying infective, non-motile micro-organisms. These non-motile bacteria were not found in the urine and the presumption is that they were walled off in the cortex and were not carried so far as the calyces to cause pyelitis. One does not know if motile bacilli had been used in the experiment whether they would attain the renal pelvis *between the tubules* in the same way as we believe they do when excreted from the blood stream into the *lumen of the tubules.* Quite recently Eisendrath has confirmed Albarran's demonstration of the invulnerability of the bladder to cultures introduced into it; but found that a pyelitis followed in his cases. As the bladder epithelium was found intact in these experiments and regurgitation of urine up the lumen of the ureter had been excluded, there remained only the probability of a urethritis (produced by voiding of the infected urine) as the primary focus from which the lymphatics had carried the micro-organisms to the renal pelvis.

Other lymph currents of interest to us are those established from the colon, appendix, rectum, female genital organs and the prostate, any of which will carry micro-organisms directly or by anastomosis to the renal pelvis. Thus it is easy to explain how pyelitis may follow chafing of the vulva of an infant or rupture of the hymen or laceration of the urethra in the newly married woman, if only C. B. gain access. Pyelitis may follow haemorrhoids, fistula, appendicitis, etc. etc. Tuberculous adenitis at the reno-pelvic junction may also be lymph borne from intestines and subsequently cause pyelitis. So much for the lymphatic route of infection of the renal pelvis. It is undoubtedly a common route and probably the usual route, although there is "quite a war on" between those who hold to the lymphatics as the only way, and those who contend for the blood stream as the carrier.

Septic nephritis is an infection of the renal cortex and is caused by a non-motile micro-organism of the staphylococcus family carried by the blood stream and lodged in the glomeruli or their vicinity, where it is walled in and neither micro-organism nor pus may show itself in the urine; but in spite of this fate of blood-borne non-motile bacteria in the kidney, it is contended by the blood-stream faction that the motile C. B. when carried to the glomeruli pass through and down the urinary tubules without setting up a walling off re-action in the kidney, so that nothing more than a bacilluria may result or, if conditions are more favourable for the C. B. a pyuria with pus casts and inflammation of the papillae in the calyces, or even generalized pyelitis.

We have seen that the lining of the renal pelvis is essentially protective in character and that when healthy it cannot be infected. Albarran damaged this epithelium by ligating the ureter, when the increasing pressure of excreted urine ruptured its lining membrane, and then infection always followed. Practically there are many things in life to take the place of a ligature and rupture the pelvic epithelium —a ureter kinked by luxation of the kidney, or bow-stringed by a vessel to the lower pole of the kidney, a stone or papilloma in the renal pelvis, congenital stricture of the outlet of the ureter into the bladder, acquired stricture of the ureter from periureteritis, pressure on the ureter by inflammatory masses either about tuberculous calcified glands, the appendix, or the Fallopian tube, pressure by the pregnant uterus, secondary back pressure from obstruction lower down as in enlargement of the prostate or urethral stricture. In all these we have essentially a ligated ureter and an invitation to invasion to the mildest-mannered micro-organism. None of these predisposing causes of pyelitis may be present, and yet generalized pyelitis result when the ureter is ligated as it were in yet one other way, *i.e.* plugged by deposit of agglutinated germs, polymorphoneuclear cells and other inflammatory debris *en masse* from the renal tubules or from rupture of suppurating peri-pelvic glands.

The assumption of the upright carriage may be worth while; but it carries penalties. There being no valves in the veins from the pelvis to the heart, a column of blood of that height drops unsupported on the pelvis, and the vessel walls give way, resulting in hæmorrhoids, varicoceles, and phleboliths in the plexus of Santorini. May not adenomata of the prostate and fibromata of the uterus also be the result of this chronic congestion? Hæmorrhoids lead to fissure of the anus and in other ways encourage migration of C. B., as does enteroptosis. Fibroids and adenomata may obstruct urination, the uterus tends to prolapse, and an eroded cervix tends to come in contact with C. B. The kidney prolapses, carrying down with it the renal pelvis to apply it alongside the ureter, to which, perhaps, it becomes cicatrized in acute flexion. This obstructs the outflow of urine and hydronephrosis follows, and the vascular pedicle is stretched and at the same time called on to hold up a kidney now congested and increased in weight because of interference with its blood supply through the pedicle itself so handicapped.

Pyelitis considered as a complete entity recognizes, and the term includes, a lesion in the intestines, vulva, or urethra, through which C. B. reach the blood or lymph stream, are carried by one or other or both of them to glomeruli and the lumen of the tubules or to peri-renal glands and intertubular lymphatics or to all of them, and set up secondary inflammation in these respective secondary areas. Inasmuch as these areas border on, and are restricted to the kidney side of the renal pelvis, the term "acute pyelitis" is not a very happy one for this stage of the disease; but it is in keeping with other nomenclature applied in this neighbourhood; thus "hydronephrosis" should be hydropyelonephrosis, "pyonephrosis" pyopyelonephrosis, and pyelonephritis accurately defines pyelitis in its later stages when the pelvis has become generally involved secondarily to the still persisting renal lesion in or about the medulla of the kidney; and, finally, the term "septic nephritis" might very well be termed cortical nephritis for the abscesses are usually confined to the cortex, and may be so walled off there that no micro-organisms or pus appear in the urine. "Acute pyelitis" with no involvement of the pelvis proper, might more appropriately be termed "medullary nephritis," but even this does not satisfactorily cover pus discharging into the renal pelvis from suppurating peri-renal lymphatic glands.

The next stage in pyelitis is inflammation in the pavement epithelium of the pelvis because of obstruction from debris or from other cause or causes already defined, and the final stage is cicatricial distortion and organic stricture, which permanently interfere with the passage of urine and produce puddles of residual urine in which infection is perpetuated. Bacilluria is a truce in any of these stages of C. B. infection, and a fillip to virulence on one side, or a bit of "run down" condition on the other, restarts pyelitis and pyuria. Finally the picture of pyelitis includes, if there be no obstruction below the utero-pelvic junction, a normal ureter and bladder but a more or less inflamed urethra where C. B. have lodged and may be phagocytized or otherwise carried back through the lymph channels to the kidney to perpetuate pyelitis.

The general symptom of pyelitis is that of absorption of septic products when pus cannot evacuate itself, i.e. intermittent or remittent fever, dependent on the degree of obstruction to evacuation, the virulence of the assailant, and the resistance of the organism. In childhood, fever is higher, and in old age lower, than in adult life, i.e. reaction is more marked in early life and less and less in evidence as life advances. In the term "fever" are included malaise, weakness, general aches and pains and other signs of intoxication of the organs of the body.

The localizing symptoms are (1) loin ache over the kidney or kidneys affected when the renal tubules become plugged and the vascular pedicle is dragged on by increasing weight and bulk of the kidney. (2) Typical renal colic when the ureter is partially and suddenly obstructed by debris, kinked ureter, etc., etc. This colic is indistinguishable from stone colic with its distribution of referred pain, sweating and vomiting in agony, etc. Complete obstruction will not cause it; cutting or tying the ureter does not cause it. Efforts of peristalsis must persist if colic is to take place and colic ceases with discouragement of peristalsis from weariness of ureteral musculature, over distention of the ureter, suppression of urine, etc. As every one knows, colic is referred to the genitalia on the side affected, but it may also be referred *in toto* to the unaffected loin and genitalia. (3) Pollakiuria during a colic is usually reflex, but occurring after the colic has passed it is associated with polyuria, the increased frequency being due to the increased supply of urine released from the previously pent up renal pelvis, and to actual polyuria from the kidney itself when released from pressure. Pollakiuria by night and day, perhaps intermittent, perhaps constant, is a symptom of remittent or constant urethritis near the neck of the bladder—an intolerance of pressure from accumulating urine in the bladder. This local inflammation may be severe enough to cause scalding urination and urgency even to tenesmus or incontinence on attempting to hold one's urine, and is not, as is usually taught, an indication of cystitis.

Any of these three symptoms being present one must look for derangement of the intestinal tract which might weaken its walls and encourage C. B. to change their saprophytic mode of life for a more venturesome roaming one. Such derangements are presented in hæmorrhoids, fistulæ, appendicitis, constipation, or diarrhoea and dysentery, or dyspepsia from whatever causes. Also one must look for symptoms of a lacerated vulva or urethra in the newly married woman, for vulvitis in the infant from dirty diapers or from wiping the anus from behind forwards, thus smearing the female genitalia with faeces, or one must look for injuries to the kidneys themselves from strains or blows.

The signs of pyelitis are: (1) Splinting of the upper quadrant of the abdomen over the affected kidney, which may often be seen in acute cases on comparing both upper quadrants carefully. It can also be felt and the renal area thus mapped out. (2) A similar splinting over the costo-vertebral angle behind, which can be more easily felt than seen. (3) Tenderness over these areas to quite gentle palpation in acute cases, and this may extend down the course of the ureter anteriorly. The Murphy thump over the kidney behind may be called for in some small number of cases; but before using it one should remind oneself that the procedure is not likely to improve an inflamed area. (4) The signs of hæmorrhoids, fistula, vulvitis, urethritis, etc.

All symptoms and signs except what may be gleaned from examination of the urine may be absent when urinary flushing is good, more especially in the chronic stage when one kidney may be almost completely destroyed without septic absorption, or at least without symptoms of it. The fifth sign of pyelitis is then of supreme importance. It is (5) A urine unaffected in reaction by C. B. but teaming with them in bacilluria, to which polymorphonuclears and perhaps pus casts of the renal tubules are added in pyuria. On sedimentation this urine has a ground glass, shimmery appearance above the deposit. Such urine may not require even a microscope to decide what causes its peculiar appearance. If the microscope is used the motile bacilli are easily distinguished moving about very actively in the unstained, warm, newly voided urine. It is not necessary usually to get a catheter specimen. If the patient voids in two glasses from a full bladder the second glass is as opaque as the first if no marked secondary urethritis is present, and, in any case, the second glass gives the above characteristics about as convincingly as if a catheter had been used.

Finally, whether only one or both renal pelves are infected can be determined on ureteral catheterization by analysis of the urine from each kidney. The cystoscope and endoscope expose any lesion of the bladder or urethra and these instruments or the x-ray will reveal complications characterized by density, such as stone, etc. A good x-ray of the urinary tract should show, not only the transverse processes and the psoas muscle, but it should give almost the complete outlines of both kidneys, and at this ideal of a radiograph we now usually arrive. By means of the cystoscope, an opaque solution in the renal pelvis, and the x-ray, any stricture, distortion, erosion, etc. will be seen. With the solution *in situ*, very accurate silhouettes are obtained but their interpretation, however fascinating, had better be left to the specialist, who can tell more of the condition of a kidney by these bloodless methods than by exposing it through what is euphoniously termed "an exploratory incision."

Prognosis. Owing to the low virulence of C. B. and excellent irrigation to keep them on the move, pyelitis is not often fatal. Even when blockage occurs it can usually, at least as far as the tract below the kidney is concerned, be unblocked by ureteral catheterization. Resolution usually takes place in acute cases and the main danger one's patient is exposed to is contentment with a persisting symptomless bacilluria or pyuria until, with or without recurrent exacerbations, there is very considerable destruction of the kidney or kidneys, pyopyelonephrosis, etc. One says "symptomless contentment" but it is doubtful if these pyuric cases ever feel physically up to the mark. Absorption of microbic and urinary toxines, unobserved by the patient, keep him constantly below what he might be physically and mentally—at least I have been struck by the sense of physical well-being which, to their surprise, often comes to these people with improvement or cure of pyuria.

Treatment naturally begins in checking further migration of C. B. from their home in the intestines, and this might be more easily done if one knew what renders them discontented, and starts out these Argonauts for new fields, *i.e.* why they leave a saprophytic, quiet life, for a parasitic, roaming one. Extirpating them from the bowel completely, is out of the question, but a brisk purgative to begin with, and a daily laxative thereafter, if it does not appreciably reduce their numbers, renders the walls of the intestine healthier, and more resistant. Calomel 1/10 grain 4.i.d., with perhaps a saline each morning, is good. Secondly, if an infant is attacked, cleanse the vulva, apply mild antiseptics where the epithelium has been broken, and avoid further contamination by care of diapers, by cleaning the anus from before backwards, and by mild protective ointments to shield the skin from C.B.-laden urine. In the newly married, incise a Bartholinian gland, if there is an abscess, (it is not always gonococci which cause this), use antiseptic douches, and injections into the bladder of, say, silver nitrate, one in one thousand, to be voided immediately on withdrawal of the catheter. The prostate in the male may call for massage and the urethra for irrigation to cut off C. B. from reaching the kidney once they have got thus far from the intestine.

There is no drug or vaccine that I know of which adversely affects C. B. when they travel in the blood or lymph streams. They may be encouraged or the ground prepared for them to lodge on by other micro-organisms which precede or accompany them from abscessed teeth or tonsils, and these foci, if found, should be eradicated. To return to our attack on the C. B. On reaching the kidney they will probably make a fight for new quarters, or they may pass through as bacilluria, and at this junction we can reach them again with an antiseptic, such as hexamine, in large enough dose to do as much damage to C. B. as possible, perhaps even to destroying them. Hexamine is harmless in an alkali, and animals, such as rabbits, who pass an alkaline urine, may excrete huge doses without discomfort. So hexamine remains inert hexamine in the alkaline blood, but becomes formaline, the antiseptic, in an acid urine. It is well to make sure of the urine acidity by adding benzoic or boric acid to each dose of hexamine and testing the urine with litmus. The dose should be as large as can be comfortably borne—a 10 grain dose four times a day may be restrictive (Kelly & Burnam)—a 15 grain dose is usually germicidal (Johns Hopkins Urological Clinic), but it often causes pain over the kidneys or scalding on urination.

I know of no other drug which may be exhibited to flush the urinary funnels as a germicide, unless potassium or soda may be deemed such. Either of these alkalies administered in large enough doses to keep the urine strongly alkaline, acts like magic in most cases of mild pyelitis, and one may feel in a day or two that their patient is completely over his attack, because of disappearance of symptoms and signs, until the urine is examined, when very often C. B. are still very much in evidence. Hexamine and potassium or soda are the only drugs I thus use, either as sedative or germicide. Kidd recommends potassium citrate in 60 grain doses every two hours in acute cases till the urine turns litmus blue, and he keeps it at that not only for this local effect, but to stave off acidosis which on the other hand may be encouraged by the exhibition of hexamine with an acid. In chronic cases, as germicide or prophylactic, he administers hexamine for prolonged periods. Kidd's book on "Common Infections of the Kidney" should be widely read. It is stimulating. From this point on, treatment consists in keeping the irrigation funnels open. If this is done, as we have seen, no spread downwards of the infection need be feared, except in the urethra where its implantation produces the annoying symptom of an irritable bladder, to be treated by Janet irrigation, etc.

We have enumerated many things which may cause blockage of the urinary system and it only remains here to define what measures to take in each case to unblock it. The ureteral catheter in this respect stands easily first. If forced ingestion of fluids does not keep the pus in the urine sufficiently dilute to have it pass the first narrowing of the ureter, then pass the ureteral catheter and through it suck out, or further dilute, the thickened urine in the renal pelvis. Two or three centimeters of silver nitrate 1/500 may be instilled as a germicide, or argyrol 5%, or mercurochrome 2%; but this is often deemed unnecessary. The opening of the ureter is usually all that is needed, and if the ureter is already congested, leaving of the catheter *in situ* decongests it just as a filiform in retention for stricture of urine in the bladder decongests or reduces oedema of the mucous membrane of the urethra. This catheterization of the ureter may be done in female infants, as cystoscopes of minute calibre are now made for this purpose. It is especially indicated in pregnancy, with fever and ache in the loin, and also when the ureter is otherwise pressed on from without, in which latter case, removal of pus tubes, appendix abscess, inflammatory retroperitoneal glandular masses, etc., should be considered; but never the removal of foetal pressure which will terminate itself in due course, and, morover, induced abortion in such cases invites puerperal septicaemia. Distortion of the renal pelvis, prolapsed kidney with pyelitis as shown by x-ray does not call for immediate open operation. It is one of the pleasant surprises of urology, how many of these heal up completely with proper use of the ureteral catheter. When it fails, plastic surgery of the pelvic outlet is to be very seriously considered before resorting to nephrectomy which, however, is sometimes necessary when the renal tissue has lost much of its function, or when secondary lithiasis fills its interior.

The notorious uncertainty of the result of fixation of the kidney in the past has more recently led to diffidence in recommending it. Since we have been able to study x-ray silhouettes of the renal pelvis we find that it is not the low position of the kidney, but obstruction at the uretero-pelvic junction which is the lesion causing symptoms, and relief follows stitching the kidney in what we have heretofore considered its ideal position only when the lesion at the uretero-pelvic junction is corrected by this procedure—by no means a certain result, and certainly a blind procedure.

Prostatectomy is indicated early in cases of prostatism, and removal of urethral obstruction in stricture, amongst other things, to prevent or cure pyelitis.

Pyelitis may be pronounced cured when no polymorphoneuclears are to be found in the urine.

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THE SYMPTOMS OF ACUTE OSTEOMYELITIS

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ACUTE infectious osteomyelitis is most frequently seen, on admission to hospital, as a well advanced disease. The patient is extremely ill and the local condition is well advanced, and usually presents a large brawny swelling that is about to break. It may, indeed, have already broken, or it may have been incised and a wound remain from which discharges large quantities of pus. Pain is severe, and the patient is almost worn out with toxaemia and pain. The involved extremity is carefully guarded from even the slightest movement. Frequently there are multiple lesions, and this adds greatly to the difficulties of the case.

Everyone has seen the cases of this disease that have survived the acute attack. They will recall the long convalescences, and the patients' tedious return to general health. More tedious still is the cure of the local bone condition. This, with its discharging sinuses arising from bone involved throughout a wide extent, persists for years, and disabilities of a permanent nature result.

Is this disease one that, once begun, must produce always such extensive bone destruction? To answer this question one might assume that, inasmuch as the condition is a local septic infection, an early diagnosis might permit treatment that would limit the spread of the infection. In order, therefore, that the early symptoms might be studied, a review of the histories of acute septic bone infections has been undertaken.

There have been eighty-six cases of this disease in the Hospital for Sick Children since 1918. This is the only acute septic infection of the diaphysis that is described in any of the histories. This disease will be referred to here as Acute Septic Osteomyelitis, and will refer to those cases only where the infection is introduced into the bone by way of the blood. Infection occurring in compound fractures does not come under an acute septic osteomyelitis classification.

It was apparent in looking over the histories that the early symptoms were not always recorded, nor in all cases were the events leading up to the onset fully described. It was evident from the large majority of the histories that they described a disease that was peculiarly constant and definite in its symptoms. There were found to be present two predisposing factors that determined the attack. The first was injury—the second, infection.

Injury: The histories in twenty-eight cases recorded a definite history. The injury was in practically every case apparently unimportant. It was such as a child tripping or twisting an ankle, knee or hip, falling off a chair, or being thrown against a wall or floor and sustaining an injury in the region of a joint. The injury was sufficient to interfere with the function of the part and if the part concerned were a leg, a limp would result. This might be very transient, and last for an hour or so, or it might persist for a day or two. If the limp were to last for a day, the patient would be said to have sustained a "sprain." The recovery from this might be complete, and a clear period intervene before the onset of the acute infection. Cases were described in which the patient reported for the primary injury, but this on examination was found not to be a fracture, and the patient was sent home only to return in a few days with an infection in the region of the injury. There were many histories that did not record an injury. In those cases it is very probable that in the severe illness that supervened, the memory of a slight injury was lost.

Infection: It has been pointed out by various observers, and very recently by Phennister, that cases of acute osteomyelitis have a superficial skin lesion. This lesion may be the ordinary furuncle, but more frequently is an infected cut or wound. It would appear, therefore, that superficial lesions may infect the blood stream. It is a fact that most cases of acute septic osteomyelitis yield a positive blood culture in the early stages of the disease. The tonsils are also to be regarded with suspicion, and it is probable that the streptococcal infections find entry here. The age in this series is always under fifteen, as this is the age limit of the patients who are admitted to the Hospital for Sick Children.

The first subjective symptoms may be local or general. Acute osteomyelitis may occur in the presence of a general infection, and in all such infections in the young, one will not infrequently see a localization appear in a bone. This type is very serious in the immediate outlook, as death may supervene in a remarkably short time; it may be a matter of hours even. In this type of case the osteomyelitis plays a very minor rôle.

The local subjective symptoms stand out in no uncertain fashion. Pain is the prevailing feature, and it is continuous after its onset. The pain during the first few hours is not necessarily so severe as to prevent walking, if the disease be in the lower limb. It will, however, produce a limp, and for this reason may be considered as only a strain. This phase soon ends, and another of constitutional symptoms and a decided increase in pain ensues. The constitutional symptoms may be very marked and may be ushered in with a chill, nausea and vomiting and high temperature. The pain by this time (six to eight hours) is severe, and is interpreted as being in or at a joint. Without exception in this series of cases, where the history of early pain is available, the pain is referred to the neighbourhood of a joint. The histories demonstrate that there is no swelling, either of the joint outlines or tissue above or below. The joint is held flexed, and the limb guarded carefully and held perfectly still. On careful examination one may, if he gets the confidence of the patient, elicit movement of the joint, and this, together with the normal and unswollen contour of the joint, should be sufficient to rule out of one's deliberations the question of acute rheumatic fever. On palpation a very definite area of tenderness is found to exist, and this area is located always just above or just below the joint, and coincides closely with the epiphyseal line of the bone. Tenderness in the early stage is quite restricted, and is, on close examination, definite. The area over which one may elicit tenderness spreads in extent the longer the case is allowed to progress. Tenderness is the first positive sign one finds in an examination of acute osteomyelitis, and in order that one may know where to examine to best advantage, he must have an exact knowledge of the location of the epiphyseal lines of the various bones. Fortunately, these lines are not very difficult to remember, but if one does not care to burden his mind with this anatomical knowledge, he may have ready access to it in any text-book dealing with bone. Tenderness over these growing areas of bone is the most important sign of osteomyelitis, and it is at this stage that one should be able to conclude the diagnosis. The blood count at this time shows an increase in the white cells of the blood; the temperature is raised, and the pulse increased. The patient is beginning to suffer so much pain that sleep is difficult or impossible, and he has not yet concluded his first twenty-four hours of illness. There is no swelling as yet discernible, and it is at this point that the doctor may be led astray into a diagnosis of rheumatic fever. In the histories under review, the provisional diagnosis of the first two or three days is seldom mentioned. Where it is mentioned, it is rheumatic fever. The treatment to which these cases have been submitted, according to the records, is the local application of various drugs, salves, ointments, proprietary and otherwise, and the internal administration of salicylates. Some cases have been submitted in the first twenty-four hours to x-ray examination. Unfortunately there is no abnormality to be seen at this stage, and the physician may, as a result, have a false security. One case in the series had five x-rays in seven days, and these were reported clear insofar as the bone was concerned. Once the provisional diagnosis is made of rheumatic fever, another point may arise that appears to substantiate it, and that is that pain appears in or about another joint. This appears to be corroborative evidence. It must be remembered that osteomyelitis is frequently multiple. The blood count does not give information that is positive in regard to a differential diagnosis, although an increase in the leucocytes is generally a marked feature.

After the first twenty-four hours, the symptoms are all more marked. The pain maintains its constant character, and sleep becomes impossible. The leg, or whatever part is affected, is guarded from any movement or jarring that might occur. The pain becomes so severe that the patient screams if he be touched. The temperature is high, with a rapid pulse and marked symptoms of intoxication. The blood culture is frequently found to yield a *staphylococcus aureus*.

After the first twenty-four hours, to the local sign of tenderness is added swelling. This is discernible in most cases in about twenty-four or thirty-six hours from the onset of the initial pain. The swelling at first is not marked, but as the days pass it advances steadily in extent. At first it is found to be just above or just below the joint, if the joint is a fairly accessible one. The common places for swelling to be first seen are the dorsum of the foot, due to infection of the astragalus, or just below the external or internal malleolus, due to infection of the os calcis, swelling just above either malleoli, due to infection of the tibia or fibula; swelling one-half inch below the head of the tibia, or just below the head of the fibula, and swelling externally or internally just above femoral condyles. The neck of femur is too deeply located to give obvious swelling, but swelling may occur over the great trochanter, or along the crest of the ileum, or on the perineum from infection of the pubis. In the upper extremity it may be seen over the scapula, most frequently at the tip of the acromion process, swelling of the shoulder over the neck of the humerus, swelling just over the condyles of the humerus, swelling over the olecranon, swelling at wrist over lower end of radius or ulna, and in the carpal and metacarpal bones. The swelling occurs exactly over the area that first experienced tenderness, and as the swelling grows in extent, it is found to progress *away* from the joint, but as it reaches a size that is causing marked enlargement of the limb, the joint begins to show some enlargement, and the synovial sac becomes outlined. This may be due to a simple local back pressure of venous return, or it may become a septic arthritis.

When the patient is first seen in this stage of local enlargement of the thigh, the case may simulate a cellulitis, but one must beware of the suspicious location of the swelling, together with the extreme pain that is manifest. The swelling increases to such an extent that it "points" after a period of two or three weeks, and eventually, if left undisturbed, discharges of itself. The violence of the constitutional reaction, in those cases that recover, subsides after the first ten days, and if left without surgical intervention they, after their abscess is discharged, make a slow recovery in their general condition, to a condition close to normal. Locally the wounds granulate, but sinuses persist, out of which now and then are discharged pieces of dead bone of varying size. This condition may persist for years.

The diagnosis of an infection of the neck of the femur presents great difficulties. The upper epiphysis lies within the capsule of the hip joint, and is therefore almost inaccessible to manual examination. The hip joint is splinted, and shows the signs of an acute hip. It may be necessary to endeavour to aspirate the joint cavity. If the joint fluid is clear, and one is confident there is an infection in the neck of the bone, he should operate upon it. If he does not interfere early, a septic arthritis is produced, and the head of the femur is separated and becomes a sequestrum.

The following is a typical history: Previous to one month ago, the boy was perfectly well. On September 8th, boy came home from school complaining of pain in left ankle; said it felt as though he had sprained it. Later in the evening he complained of headache, and said he felt chilly; he became very feverish after going to bed and did not sleep for pain. On the following day the boy was sick at the stomach and vomited. The pain in left ankle increased; and the lad could not put weight on his foot; the ankle looked normal.

September 10th: Began to complain of pain in the right ankle as well, but constitutional disturbance less.

Sunday, September 11th: Both legs began to swell, especially the right, both quite hot and red. Patient was very feverish, and would not attempt to put weight on either limb; very tender to touch. Seen by doctor. Diagnosis rheumatic fever, and put on treatment.

For next week patient was quite delirious, and legs swollen and painful. About September 20th mother says two yellow blisters appeared on anterior surface of right leg about half way down. When hand was rubbed over those areas, it gave the impression of a hole being beneath (about one inch across). Rubbed with camphorated oil, and dressed with absorbent. Boy complained a great deal of pain, and on dressing being removed, there was free discharge of pus from right leg. Abscess found two to three days later on left leg, and began to discharge. Rheumatic abscesses seen by doctor every second day—hot applications. Abscess also appeared on left ankle, and was opened. Abscess formed on knee was opened. Slight discharge.

Came to hospital in thirty days. Right leg—ankle very swollen, bluish in colour, extremely tender, and joint seems disorganized, abnormal motility in almost every direction. Swelling most pronounced over internal malleolus, and here there is fluctuation. Over external malleolus, three sinuses. Sinus seems thickened, and the leg is very tender. Bare bone may be felt through both sinuses.

Left Leg: The left ankle is also swollen and purplish in colour, most marked over the malleolar region. There does not seem to be so much destruction of the left ankle joint. Over left shin, three discharging sinuses. Upper sinus in region of tibial tuberosity. Upper epiphysis is quite loose, and apparently partially detached from the shaft. Knee is not involved.

The diagnosis of acute osteomyelitis is extremely urgent. The symptoms and signs are clear-cut and obvious. The preceding history relates a sprain, or a slight injury to a growing bone. Injury is done the growing line of bone because it is not yet rigid, and it is the spot where the stress is taken up, and damage results. Coexistent with the pain or injury, there may be a superficial infection, or a sore throat. One should view with alarm the co-existence of these factors—infection and injury—and would be well advised to take a child off his feet for the time being. The disease having begun, the diagnosis depends upon general reaction and local tenderness. This tenderness is in the direct location of an epiphyseal line. These are the only points one requires for the diagnosis. If one waits until the condition becomes full-blown, they have caused that patient agonies that could have been cut short; they have rendered a condition that might have been cured in two or three weeks, one that will take years to cure.

The public require education in the seriousness of this condition. This series of cases demonstrates that about thirty per cent. of the cases do not consult a doctor during the first four days or more.

THE NEW BISMUTH THERAPY OF SYPHILIS

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A POWERFUL ally has been added to our available forces in the battle against syphilis, in the form of bismuth. Bismuth has long been known to possess bactericidal properties, but, the preparations hitherto employed, and the manner of their administration were not attended with results sufficiently good to justify their use in this capacity. The salts of bismuth with which we were most familiar were the subnitrate, carbonate, subgallate, benzoate and the salicylate. With ordinary therapeutic doses, taken by mouth, the amount of absorption was inadequate, while large doses, sufficient to have effect, were frequently followed by unlooked-for consequences.

The Pasteur Institute, after intensive study of the subject, has retrieved bismuth from the position of obscurity into which its inefficiency and toxicity had plunged it, and brought it out in new forms which have given most gratifying results.

Fournier was the first to introduce these new salts of bismuth in the treatment of syphilis in the Paris Hospitals. In 1921, after a period of experimentation, he announced to the Academy of Sciences the results obtained. These demonstrated, incontestably, the properties of bismuth as a spirocheticide and its curative action in syphilis. Following these reports the use of bismuth spread rapidly to the large European clinics, and the claims which Fournier made have been amply substantiated by the results which have since been obtained.

Among these newer salts of bismuth, the most important are: the hydroxide, iodo-quinate, the sodium and potassium tartrate, and the succinate. Of these, the first two, the hydroxide and the iodo-quinate of bismuth, have been generally adopted as the most efficient for routine use, being also the least painful and toxic. The hydroxide of bismuth occurs as a fine crystalline powder, white in colour. The iodo-quinate is a powder of a slightly thicker consistency and deep red in colour. The dosage of each is from 6 cgm., the minimum initial dose, to 15 cgm., the usual maximum. Both these salts being insoluble, they are prepared in the form of oily suspensions and are administered by intra-muscular injection, usually three times a week. The average course consists of ten to fifteen injections, totalling one to two grammes of bismuth. This is followed by a rest period of about one week, after which the course is repeated. The number of such courses required is determined by the stage and the progress of the disease.

Under the name of 'Muthanol,' ampules containing a ten per cent. mixture of bismuth hydroxide in oil are obtainable, while the iodo-quinate is similarly put up under the name of 'Quinby.' These, when slightly warmed and shaken, form emulsions which are easy to inject through a comparatively small needle. The soluble salts of bismuth, of which the tartrate is an example, have not been found satisfactory to the same degree as the insoluble ones. More recently, a solution of colloidal bismuth was introduced for intravenous administration. The results following its use have not been as favourable as anticipated. It is slightly more toxic and decidedly less effective than the hydroxide or the iodoquinate.

Bismuth is known to exert a direct action upon the spirochaete, having the effect of a true antibody. This is in contradistinction to arsenic, which acts, not only upon the offending organism, but upon the host. The bactericidal action of bismuth is much more powerful than that of mercury, in safe therapeutic doses; bismuth, therefore, is the most potent spirocheticide at our disposal. The following figures have been arrived at by a study of approximately three hundred cases of syphilis, at the Finger Clinic in Vienna and the St. Louis Hospital in Paris. All stages of the disease were represented, and prior to the bismuth treatment, these patients had had no medication whatever. At the time of writing, these cases had been under treatment and observation for periods of six to twelve months.

In the majority of cases in the primary stage, no spirochete could be demonstrated twenty-four hours after the first injection of bismuth. Most of the sores were completely healed after four or five injections, in eight to fifteen days. Adenopathy accompanying the primary sores showed equally good response to the drug.

In secondary syphilis the action of bismuth is not quite so uniform. Mucous patches disappear with remarkable rapidity, nearly all within six to eight days, after two to four injections.

On the secondary skin eruptions, the action of bismuth is variable to a slight extent. Some dermatoses clear up rapidly, within six to eight days, others require considerable longer periods. In nephritis, occurring in the secondary stage, bismuth is at its best. All cases hitherto treated have cleared up within fifteen to twenty days, with six to ten injections.

On the Wassermann reaction the action of bismuth compares very favourably with that of salvarsan. The average length of time required to obtain a negative reaction is a little greater than with arsenic, although that end is frequently accomplished in twenty to thirty days of treatment. But if bismuth is, in general a little slower in converting the blood, this drawback is more than compensated for by its power to render the serum negative, which had remained strongly positive under salvarsan, in the so-called arsenic-fast cases.

Tertiary syphilis reacts well to bismuth, gummata and ulcerations frequently healing completely within fifteen to twenty days of treatment. It is, however, in tabes dorsalis that the specific action of bismuth is most manifest. Early cases respond in a manner nothing short of marvellous. Lightning pains disappear almost instantly. Crises and other of the painful symptoms of this condition are greatly improved in very little time under bismuth. Advanced cases of cerebro-spinal lues, and even general paralysis have shown some improvement with its use.

Coincident with the improvement noted in the subjective symptoms, changes in the cerebro-spinal fluid are effected. Under the influence of bismuth the fluid quickly becomes normal as shown by the Wassermann reaction and by the cell and globulin contents. Recurrences in the nervous system, such as occur with the salvarsan group in a certain number of neuro-syphilitics, and which may be a source of great danger, never appear with the bismuth treatment.

Visceral syphilis does well under bismuth, and cases of aortitis, osteitis, and ocular affections have shown speedy and marked improvement. In hereditary syphilis, some very successful results have been obtained, both in the lesions and in the serological condition.

After intramuscular injection, bismuth is absorbed rapidly. It can be demonstrated in the saliva within twenty-four hours of injection, and in the urine, frequently within eighteen hours. In the cerebro-spinal fluid bismuth can be recovered within ninety-six hours of the first injection. As treatment progresses the elimination becomes retarded. After two or three series of injections have been administered, bismuth can be found in the urine as late as twenty-eight days after the last dose.

The potency of bismuth would seem to be, in a measure, associated with its excretion. It is eliminated chiefly by the salivary glands and the kidneys, and into the cerebro-spinal fluid, and it is just in these situations that the drug is most effective. Bismuth is also considered to be an efficient prophylactic against syphilis. One or two intramuscular injections, prior to exposure to the disease, is said to prevent infection.

As to the toxicology of bismuth, the text-books ascribe the following disorders to its prolonged and excessive use: salivation, stomatitis, dark discolouration of the gums, ulceration of the throat, diarrhoea and albuminuria, and in extreme cases, even death. Many patients, on the other hand, can take large doses, four to five drachms daily, without any apparent harm. It is known, however, that the toxic symptoms were due, to a great extent, to the admixture of arsenic and tellurium and other impurities in the process of manufacture, and not to the bismuth proper. Further, the subnitrate, in certain intestinal conditions, liberates nitric acid and nitrates, and these have caused some of the deaths recorded. With the newer preparations of bismuth as used in the treatment of syphilis by intramuscular injection, no fatality has, up to the present time, been known to occur.

Seventy per cent. of the patients treated bear the drug well, and show no untoward effect whatever. In thirty per cent. of the cases, however, some sign of toxicity presents itself. Of this number, a large proportion exhibit only a slight intolerance to the bismuth, as exemplified by a mild form of stomatitis and salivation, which in a few days disappear without any special attention. A more severe effect is gingivitis with a bluish-black line, resembling plumbism. This usually begins with the lower gums near the dental margin, and may go on to ulceration. These affections of the mouth may appear at any time during the treatment, occasionally early, after the second or third injection, but more often they occur late, after the second or third series. The administration of Fowler's solution, both locally and internally, together with ordinary oral prophylaxis, have been found sufficient to overcome this condition, and, except in very severe cases, treatment need not be interrupted.

A group of symptoms referred to as "grippe bismuthique," and characterized by headache, malaise, weakness and fatigue, and accompanied by albuminuria of a severe grade and jaundice, occasionally arises during bismuth treatment. This condition occurs, usually, after the second or third series of injections, and represents the cumulative action of bismuth. The patient feels and looks quite ill, but the affection is not at all a grave one. Temporary suspension of the bismuth and the administration of tonics, principally iron and arsenic, will restore the general health in a very few days. In a small number of the cases, the injection of bismuth causes local pain and induration lasting one or two days. The greater number, however, experience no local discomfort whatever.

It will be remembered that all patients exhibiting untoward effects, whether local or general, are included in the thirty per cent. referred to at the outset, while seventy per cent. of the total number show no unfavourable signs of any nature. It is also to be noted that no toxic symptoms occur which cannot be overcome by suspension of the treatment for a short time. No case of absolute intolerance to bismuth, such as may exist in relation to arsenic, has been recorded, and there is no disturbing element, comparable to the Herxheimer reaction, following its use.

As previously described, bismuth is useful in all cases of syphilis and in all its stages. It is particularly indicated, however, in those patients who have a natural susceptibility to arsenic, rendering them intolerant to treatment with the salvarsan preparations, and in the other class of cases which show abnormal resistance to arsenic, continued use of which fails to bring about the desired effect. Bismuth is also especially indicated in those cases where a Herxheimer reaction, should it occur, might aggravate the existing condition to a dangerous degree, as for example, cerebro-spinal lues, or syphilis of the kidneys.

As to the place of bismuth in relation to arsenic and mercury in the routine treatment of syphilis, various practices prevail. The success following the use of bismuth has justified some clinicians in relying entirely upon bismuth to the exclusion of all other drugs. The system, however, as carried out in most of the large European Clinics, and which has been found most reliable, is as follows:

First—an intensive attack upon the infection with salvarsan, (or neo-salvarsan), consisting of a course of eight to twelve intravenous injections, totalling approximately ten grammes of neo-salvarsan, followed by a rest period of about one week. Bismuth is next administered, by a course of ten to fifteen intramuscular injections. After another rest interval, the treatment is continued by mercury in one or another of its forms, preference being strongly shown to intramuscular injection of an insoluble salt, and intravenous administration of a soluble one.

This general outline is varied as to the sequence of the drugs and the length and frequency of the courses, to suit individual cases. In the later stages of the disease iodine is added, as indicated.

At the present time it is not at all certain that we can bring about an absolute cure for syphilis. It would seem rational, therefore, to employ the whole array of available anti-luetic remedies, until such a time as the criterion of cure shall be more definitely established, rather than to pin one's entire faith upon the special merits of any one of them.

Dean of St. Paul's on Mental and Spiritual Healing.—The Dean in an address before the Marylebone Division of the British Medical Association, stated that a closer co-operation between the medical and the clerical professions had long been a matter very near to his heart. It was very necessary that religion should become scientific, and that science should cease to be—if it ever was—materialistic. Nevertheless, when one left generalities of that kind, the difficulties of the position became obvious. There were in evidence, for example, various methods of faith healing, from Christian Science to the creed of M. Coué; it was difficult to say how far these methods had any scientific value. Before the war he was a member of a committee sitting at Westminster, composed half of clergymen and half of doctors, the object of which was to investigate the methods of mind cure and faith healing which were advertised or followed. When the committee examined those who professed to work miraculous cures by religious means his own impression was far from favourable. It seemed to him that not only did their evidence break down, but their whole attitude was unsatisfactory. All were agreed that hysterical and nervous cases were benefited by these methods, and equally that such a thing as a broken leg could hardly be benefited; but there was a large class of intermediate cases, including diseases caused by micro-organisms, about which more evidence was desirable. He wanted to know whether or not the encouragement of the patient and the awakening in his mind of a lively faith that something was going to happen might have some effect, possibly by the production of some kind of hormone, actually to destroy the germs of disease. At all events, of late years the functions of the ductless glands had excited very great interest, and there was still much to learn about their action. When Edward VII, not many years before his death, was in Germany he was found to be suffering from a mild form of diabetes, and a consultation took place, attended by four German doctors and one English doctor. The Germans became so furious with each other as almost to get to blows, and after the altercation had gone on for some time the English doctor said, "Really, gentlemen, I believe that if we took our tests we should find that most of us were suffering from glycosuria." Rather impressed by this idea, the Germans did make the test, and found that three out of the four had sugar. If this could be the consequence of anger, as seemed probable in this instance, it was possible that the awakening of a lively hope in the mind of the patient might have effects not yet determined in the opposite direction.—Brit. Med. Journal, Mar. 10, 1923.

Postinfluenzal Chronic Pneumonitis.—It is commonly stated that influenza predisposes to pulmonary tuberculosis. This may be true, says Francis H. McCrudden, Boston; but he also asks whether it is not possible that this belief is due to the confusion of tuberculosis with the postinfluenzal nontuberculous, pulmonary conditions described in this paper. We all see cases of pulmonary disease in which the tubercle bacillus cannot be found in the sputum, and cases in which physical changes characteristic of pulmonary tuberculosis cannot be found in the lungs, which are, nevertheless, diagnosed as possible, or even probable, pulmonary tuberculosis. But in the case of a patient giving a history of severe influenza and pneumonia, preceded by good health and followed by chronic pulmonary disease, a diagnosis of pulmonary tuberculosis should not be made unless either physical or roentgen-ray findings show the definite characteristics of pulmonary tuberculosis, or the sputum shows tubercle bacilli. It is possible that pulmonary tuberculosis may attack a person suffering from this postinfluenzal pneumonic condition, so that the two conditions may be present in the same patient, or that pulmonary tuberculosis may immediately follow a severe case of influenza. McCrudden reports four cases to illustrate the points made.—*Jour. Am. Med. Assoc.*, March 3, 1923.

Retrospect

EPILEPSY

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In an article entitled the "New Pathogenesis of Epilepsy," Rojas in the *Revue Assoc. Med. Argentina* attributes the apparently excitatory phenomena to failure of the cortical inhibitory centres to keep the balance. Unconsciousness and amnesia are difficult to explain on the ground of cortical excitation, and rather point to functional cortical suppression. Epilepsy, therefore, he concludes, is a syndrome of sudden cortical inhibition which dislocates the mechanism of inferior centres.

The same conception is outlined by Sargent in a very interesting and suggestive article in *Brain*, Vol. 44, part 3. "When loss of consciousness and convulsive movements result from the same cause, we can conclude that these movements point to a suppression, not a stimulation of cortical activity. The tonic stage of muscular contraction seems to indicate not a discharge of energy from the cortex, but the liberation of a lower level mechanism from cortical control. The unconscious rigid epileptic is for the moment a decerebrate man." Sargent feels that sufficient importance has not been attached to the possible effects of seemingly minor and transitory disturbances of circulation on cerebral function, and therefore emphasizes a vascular hypothesis of the pathogenesis of epilepsy, calling attention to the fact that as long as twelve years ago, A. E. Russell hinted that, so far as the causation of epilepsy is concerned, inquiry into the processes, both nervous and chemical, by which the cardio-vascular apparatus is governed, might afford a valuable clue. Directly associated with this conception are the convulsive phenomena in heart block and the few recorded observations of pulse failure during epileptic attacks.

"It requires no great effort of the imagination to suppose that cortical control may be suddenly cut off by a sudden and transient disorder of the cortical circulation, and cause, according to the extent and duration of the circulatory disturbance, varying degrees of decerebrate rigidity." This statement is made apropos of Kinnier Wilson's work on decerebrate rigidity, in which clinical evidence is shown that such rigidity, both with and without the occurrence of tonic fits, occurs in man as a result of lesions which interrupt the cortico-spinal path, and is strictly comparable to that which obtains in animals when the mesencephalon has been transected.

But while tonic fits might be thus explained, it is by no means easy to explain the clonic spasms, which apparently depend on the same motor mechanism as Jacksonian fits, and exhibit the phasic character of movements associated with cortical activity. According to the above hypotheses there occur in a typical epileptic seizure first a cutting off of cortical control and liberation of lower centres, and then an ill-regulated outflow of cortical energy, corresponding to the tonic and clonic stages respectively.

It must be confessed, however, that while the mechanism of tonic and clonic fits may be partially explained in the light of motor phenomena observed in decerebrate animals, Jacksonian attacks resulting from definite organic lesions, and experimental work on the cortex such as electrical stimulation and blanching of the cortex with adrenalin, the condition underlying essential epilepsy is still unknown.

Frisch and Weinberger (*Zeitschrift für Neurolog. und Psy.*, Oct. 1922), contribute two articles dealing with metabolic variations in epileptics. Investigations were made in intervals between attacks, and during and following attacks. Metabolic disturbances are described as factors regulating "convulsive tolerance" in the sense that through their influence on the biochemistry of the cell they change the degree of irritability of the brain; that stimuli otherwise subliminal become effective during the disturbance; and the peculiar changeableness of metabolism in epileptics is responsible for the variations between health and illness.

Tables are given showing changes in weight, non-protein nitrogen (RN) and sugar percentage in blood, and galvanic irritability of muscles in six patients observed daily for fourteen or fifteen days.

In patient No. 1 a marked increase of non-protein nitrogen in the blood was observed. with still further increase up to the night when three attacks occurred. Next day there was a decrease, but not to normal; after three days the percentage fell to normal. The blood-sugar percentage ran about the same course. There was a decline of 1.5 kilos in weight after the attack. Examination of patient No. 2 gives a somewhat similar result. In patient No. 3, the RN mg. percentage was 30 and the blood-sugar 139 the day before the attack; the day after the figures were 19 and 109 respectively. The galvanic irritability in these three patients, especially AOC, varied with the chemical disturbance. The pre-paroxysmal increase and post-paroxysmal decrease in weight were ascribed to retention of water in the body tissues and subsequent excretion, this in turn depending upon variability in mineral constituents in blood and tissues.

While in normal individuals the sodium chloride and calcium percentages in the blood are remarkably constant, notable variations were found in the patients examined.. In patient No. 1, the former sank from 498 mg. per cent eight days before an attack to 447 mg. per cent the day following an attack, while the calcium increased during the same time from 9.97 to 12.91 mg. per cent. In another patient there was a diminution of 50 per cent. in the sodium chloride blood content. The authors ascribe the pre-paroxysmal diminution of sodium chloride in the blood to an increase of sodium chloride with a corresponding retention of water in the tissues, and the increase of calcium in the blood to a lessening of calcium in the tissues, this latter being the decisive factor in the increased irritability of the central nervous system and a result of acidosis caused by endocrine changes. They remind us that the brain may share in the tissue swelling, and cite experiments on animals showing that the brain is capable of an increase of 9 per cent. of its weight.

These investigations are of more than scientific interest, even though the authors' hypotheses are as yet unproven, and may point the way toward rational therapy. Leahy, *N. Y. State Jour. Med.*, Jan. 1922, cites a number of cases in which there appeared to be a definite relation between ovarian disturbances and epileptic attacks, with marked improvement in two cases treated with corpus luteum, and other cases of epilepsy showing dyspituitarism with diminished secretion.

L. Pierce Clarke (*Amer. Jour. Med. Sc.*, Feb. 22) describes fainting attacks in rapidly growing adolescents, which resemble petit mal, and which he ascribes to pituitary disturbances.

The part played by endocrine disorders or imbalances in epilepsy is, however, by no means clear. There are not enough data at our disposal to warrant our coming to a conclusion.

The Arthritis of Serum Sickness.—Among ten patients with serum disease who had received large amounts of horse serum intravenously, there were six who showed definite joint involvement. From the joints of four of these, Ralph H. Boots and Homer F. Swift, New York, were able to aspirate fluid having the gross and microscopic character of an exudate. From a fifth, in whom pain was the only symptom, no fluid could be obtained; the joints of the sixth were not aspirated. The positive findings in the synovial fluids from the four other patients, however, indicate that the arthritic symptoms in serum disease are due to an actual inflammation of the joints. The demonstration of horse serum in two fluids suggests that the irritation of the joint may be due to the presence of this foreign protein in an allergic tissue. Clinically, the polyarthritis of serum disease is usually manifested by pain and tenderness of the joints, but in certain instances swelling, heat and redness may be present. The synovial exudate is microscopically indistinguishable from that occurring in joints of patients with rheumatic fever.—*Jour. Am. Med. Ass.*, Jan. 6, 1923.

Editorial

WHAT THE PROFESSION OWES THE RURAL PRACTITIONER

THE article which we publish in this issue on the "Problems of country practice" demands the attention of all who have to deal with the health and well being of the community. Provincial and Federal Governments must recognize that improved conditions of medical service in rural districts will tend to a lowering of the mortality rates and to securing stronger and better developed citizens. Unfortunately it is not yet a settled question to what extent the improvement of medical and sanitary conditions in a community should command the expenditure of state funds. It is the duty, however, of the profession as a body to recognize the difficulties under which a physician in the country carries on his work, and the necessity of not only assisting him ethically in consultation (*vide* Dr. Walter's paper) but also in the formation of district Societies, and in their maintenance.

There was a time when mortality rates in country districts were distinctly lower than those in cities and when rural practitioners were well able to keep abreast of advances in medicine. When the chief dependence in diagnosis lay in careful observation of the patient and the use of such simple instruments as could be found in the armamentarium of every physician. At that time the names of many country practitioners were in the list of those whom the profession to-day delights to honour for their contributions to medical knowledge. Jenner, MacDowell, Beaumont and many others were country practitioners. In more recent years science has made great strides and scientific medicine to-day demands for the best and most efficient work, a laboratory where expensive apparatus calls for the skill of specially trained men, a condition which acts to the disadvantage of the country practitioner in more ways than one.

To alter this condition Victor Vaughan in a paper read before a recent Medical Congress recommends the establishment in rural districts of medical centres equipped with the means of carrying out all modern tests necessary for the determination of the causes of disease. Small communities of twenty to forty thousand people should have the power, on obtaining the necessary majority vote, to make a definite levy upon all its members for the equipment and upkeep of such centres. The health and sanitation of the community should be recognized as having a claim at least as urgent as that of education on state funds. These centres should if possible be associated with a small hospital equipment; a few beds, a well-trained graduate nurse, one or two probationers, a housekeeper and a chore-boy, all under a committee appointed perhaps in part by the Government and in part by the local community.

The Dominion Government last year voted a considerable sum for the treatment of venereal cases. Why should the grant not be enlarged sufficiently to include examination of sputum, blood, stomach contents, bacterial smears and sections of new growths? Such a scheme demands the education of the public, and will we fear, require time.

In the meantime much will be gained by the co-operation of physicians in neighbouring counties and municipalities in the formation of small district medical societies, meeting either in a suitable hall or in one another's houses, for the reporting of cases of interest, or the reading of abstracts of papers valuable either in themselves or as productive of discussion. Ontario, with its donation from the local Red Cross Society is setting an example to the other provinces in its efforts to stimulate and assist its practitioners residing in rural districts. We publish in this issue an abstract of an address by the President, on the aims and activities of the Ontario Medical Association. The profession in Alberta and British Columbia are also alive to the necessity for co-operation and the establishment of small hospitals. In Alberta we are informed that already many efficient hospital centres have been established by churches, private corporations, and by a few municipalities, which are doing good work, enabling physicians to give more effective assistance to patients in outlying districts. Much work must be done by the profession itself, however, before much advance can be made along these lines; the public must be educated to appreciate the necessity for the establishment of such centres, and some system must be devised by which the cost of them may be borne to a considerable extent by the community, in order that the expense to patients may not be too great.

In our opinion the public generally, and we fear too often the city physician do not sufficiently appreciate the difficulties of the country practitioner making his visits on dark and stormy nights, over rough and scarcely travelled roads, and obliged to rely in cases of urgent difficulty upon his own wit and the contents of his well filled bag.

SYMPTOMS AND TREATMENT OF DISORDERS OF THE DIGESTIVE TRACT

We publish in this issue several papers which have to deal with symptoms and treatment of the various forms of that very prevalent syndrome, disordered digestion. Gastric and duodenal ulcers are interesting to the internist, the surgeon, the pathologist and the biochemist. One might suppose that the very considerable literature which has appeared recently in the medical journals had put on a fair and sound foundation the main questions involved in so simple a process as benign ulceration of the stomach and duodenum.

We do know that the condition occurs. We have seen the ulcers in the living and in the dead. Our knowledge of their etiology is mostly theoretical, and indeed no theory yet advanced has received universal acceptance, for no theory has presented many well accepted reasons for its adoption.

Gastric and duodenal ulcer, as a rule, give rise to a group of symptoms that are rather definite and yet no group of symptoms can be depended upon to give a hundred per cent. accuracy in diagnosis. These ulcers are found at autopsy in patients who have died from other diseases and who during life had no symptoms suggesting ulcer of either the stomach or duodenum. Again the first symptom may be a severe haemorrhage or a perforation. Scars indicating healed ulcers of the stomach and occasionally of the duodenum are sometimes found at autopsy. They may come and they may go and we know not why they came nor the conditions that favour spontaneous repair.

Epigastric pain bearing a constant relation to the taking of food is the important symptom. In gastric ulcer nausea, vomiting and occasionally haematemesis may also be present. Radiological examination and fractional gastric analysis are valuable aids in completing the diagnosis.

The treatment of chronic gastric and duodenal ulcers is on the whole satisfactory. Improved technique has lowered the mortality rate almost to the vanishing point. Moynihan reports 500 consecutive cases without a death. In the majority of cases the symptoms disappear after operation and in nearly all there is a marked improvement in health, with improved nutrition and increased weight. In the treatment of chronic gastric ulcers near the pylorus, Moynihan inclines to resection of the end of the stomach. This operation is more formidable than a gastroenterostomy. The results are excellent and the mortality a little higher.

There is evidence that acute ulcers heal under favourable conditions and under proper diet and rest, and there is reason to hope that in the future, the chronic form may be seen less frequently than in the past. G. E. A.

TOBACCO SMOKE

ALL of us who smoke have often wondered what it is in the fumes that causes the well-known pleasant or unpleasant effects. In a recent editorial of the *Journal of the American Medical Association* for March 3rd, 1923, entitled "What we get when we smoke," the results of the recent work of Baumberger and of Lee are discussed. Carbon monoxide, the lethal agent in illuminating gas and in the exhaust gas of motors, is also present in tobacco smoke. Its poisonous effects are due to the avidity with which haemoglobin takes it up, oxygen at the same time being displaced, for the red cells have 225 times as great an affinity for carbon monoxide as for oxygen. Tobacco smoke may contain from 7.2 to 25 parts of carbon monoxide in 10,000 parts of air, but the most hardy smoker takes many breaths of fresh air between "puffs" and it is probable that the maximum saturation of haemoglobin by carbon monoxide, which occurs in the blood of a devotee to tobacco, is only ten per cent. and this amount does not usually call forth symptoms. On the other hand, it has been shown that a concentration of about twenty-two per cent. will produce headache, and perhaps a shortage of oxygen will be felt by the smoker during exercise.

It is now concluded by Lee that nicotine and not pyridine, a decomposition product, is the chief poison in tobacco smoke, for tobacco smoke causes the same physiological effects as nicotine in corresponding concentrations. It has been computed that eighty per cent. of the tobacco of a cigarette is smoked and that in the "puffed" smoke of every cigarette there is about 5 mg. of nicotine. Of this, sixty-seven per cent is absorbed if the smoke is drawn into the mouth only, and eighty-eight per cent. if the smoke is inhaled into the lungs. How much nicotine reaches the blood depends greatly upon the amount lost in saliva. Increased intracranial pressure, giving rise to headache, is caused by both nicotine and by the decreased oxygen in the blood due to displacement of this gas by carbon monoxide.

If a cigarette smoker were to puff steadily for an hour and inhale, he might absorb 36 mg. of nicotine and 27.5 mg. if he merely drew the smoke into his mouth. It is surprising that "inhaling" does not yield a much greater absorption of nicotine than mere "puffing." Marked effects would be produced after this hour of concentrated intimacy with the *herba santa* but consolation may be sought in the fact that 500 mg. taken at one time is the lethal dose! The other substances in tobacco smoke are not fully known, but experimental evidence shows that nicotine and carbon monoxide cause most of the effects observed.

An explanation has also been offered for the more pronounced effects of cigar and pipe smoke than those produced by the smoke of cigarettes. Although cigarette tobacco contains nearly twice as much nicotine as cigar tobacco the smoke of the latter is twice as toxic. During the slow combustion of a cigar, however, "immediately behind the point of combustion is an area in which the water and other volatile substances condense; during the act of smoking, the hot gases pass through this moist area and volatilize the more volatile principles of the tobacco, of which nicotine is one. Therefore the smaller the moist, hot area behind the point of combustion, and the more rapid and complete the combustion, the less likely is the smoke to contain volatile toxic bodies." We now see why a thin cigar yields fewer of these products than a "fat" one and why the smoke of a relighted cigar or pipe is unpleasant in its effects.

For those who are interested in the neurological side of the effects of tobacco we recommend them to read Frankl-Hochwart's monograph *Die nervösen Erkrankungen der Tabakraucher*, Wien u. Leipzig, 1912.

Editorial Comment

NATIONAL HOSPITAL DAY

Believing that an invaluable service in educating the public to the real functions of a hospital, could be rendered by an organized effort to focus attention on institutions for the treatment and care of the sick and unfortunate, a campaign was begun in 1921 for the observance of a national hospital day on May 12th. This day was selected as it is the anniversary of the birth of Florence Nightingale, and on this date will be held this year the third national hospital day. The following are some of the suggestions for a programme for that day: Graduation exercises of the training school; parades; hospitals will have "open house" for visitors with members of the staffs to act as guides; circulars and pamphlets to be distributed showing interesting facts and statistics about the hospital; churches can make mention of this "Day"; motion picture houses by slides can do their bit; newspaper publicity. The observance of this "Day" by hospitals throughout the country has done much to place hospital problems before the people in their several communities. The National Hospital Day committee is preparing plans for the third National Hospital Day which takes place on May 12th, under the presidency of E. S. Gilmore, superintendent, Wesley Memorial Hospital, Chicago. Dr. Malcolm T. McEachran, of the Vancouver General Hospital, is vice-chairman.

Dean Inge on Birth Control.—The Dean spoke on birth control—a social, racial, and economic, as well as a moral and medical question. He reminded the audience of the facts with regard to the increase of population. The birth rate in this country reached its maximum of 36 per 1,000 in 1877, when the death rate was 21 or 22. The birth rate had declined, almost in a straight line, except for the war years, until last year the figure was 20 per 1,000. The death rate, thanks mainly to the skill of the medical profession, had declined in a parallel line, and last year was 12 per 1,000. Were there any in that room who would hold that the old birth rate of 36 per 1000 could have been maintained, in view of over-crowding and unemployment, with a death rate of 12? It seemed to him quite obvious that in some way or other the birth rate had to decline, and also that a time must be reached—not very far ahead—when this country could no longer support a further increase in the number of its inhabitants. That being the case, it did not seem very creditable either to their profession or his own that they should have joined in discountenancing and condemning any attempts to regulate the birth rate, and he said this with the more confidence because the statistics showed that the very bottom place in the birth rate was held by the members of their two professions. That was not satisfactory, nor even honest. The differential birth rate, of course, was a very striking and dangerous symptom—the birth rate was two and a half times as high among unskilled labourers as among members of the learned professions. With regard to methods of controlling births, opinions differed both as to moral and medical aspects. He would plead only for candour and honesty. Doctors in these days had entered into the position of the priests of the Middle Ages. They heard confessions, they imposed penances, sometimes fantastic ones. They were listened to, and what they said was accepted as authoritative. The physical and moral welfare of the country was largely in their hands. Let them tell the public what it was good for the public to know, and especially the clergy, to save them from making all manner of disastrous mistakes.—*Brit. Med. Journal*, March 10, 1923.

Men and Books

A MODERN SCHOLAR-PHYSICIAN

SIR NORMAN MOORE, Bart., has recently died at the age of seventy-five, and thus passes perhaps one of the most representative of modern scholar-physicians. Born in Lancashire in 1847, Norman Moore was educated at Owens College, Manchester, and St. Catherine's College, Cambridge. He entered St. Bartholomew's Hospital as a medical student, and took his M.B. (Cantab.) in 1872, and M.D. in 1876. For his hospital he did yeoman service. He was elected assistant physician in 1883 and physician in 1902, and consulting physician in 1904: an instance of the slow promotion of meritorious men which is possible in some of the London hospitals. He lectured, after his graduation, on comparative anatomy, pathology, and on the principles, and practice of medicine.

He was Warden of the Medical School for nineteen years during which time he lived within the precincts of the hospital. The Warden's position is different from any in this country for he has direct charge of the students and in this way comes into close contact with them, especially so with those amongst their number who are residents in the College. Moore's influence and stimulus was great amongst them, both inside and outside the wards and lecture rooms, for it was possible for him to advise them on questions of their medical education and in the general conduct of their lives. He taught them to read old books, not because they were old, but because they were good. He was not stinting in his praise of accurate observations made by his house-physician or clinical-clerk if they were expressed in a well-worded note. During this time he published valuable papers on pathology, notably one on the *Morbid Anatomy of Gout:* at Barts, even to this day, outspoken examples of this disease are very frequent compared with the number of those seen in Canada. His clinical experience with hospital cases was very large and down to the year of his death he used to appear at the medical consultations, which are held weekly in a large room, the medical staff, house-physicians and students being present, and after all his junior colleagues had spoken, he would express his opinion of the difficult cases shown there.

His crowning achievement for his hospital, founded eight hundred years ago by the monk Rabere, was the publication, in 1918, of the *History of St. Bartholomew's Hospital* in two large, well illustrated volumes. This was the result of thirty years of untiring research amongst the mediaeval and later charters and records of the Foundation and his work took him into many fascinating by-paths of English history and English literature. This history is full of anecdote and it contains as much about the avocations as about the vocations of the medical men. In the chapter on Harvey—the greatest Barts man—we even find an account of the various men who signed his diploma of M.D. in Padua in 1602. Norman Moore showed himself an expert in the history and topography of the City of London from its earliest times. It was a pleasure to hear him tell by his own fireside of the changes wrought by time and man in and about Smithfield and of the Roman remains which have been brought to light in recent years.

As devoted as Norman Moore was to Barts, he was just as much in love with the history and traditions of the Royal College of Physicians founded in 1518 by Henry the Eighth, Linacre (a medical humanist and greatest of the English scholar-physicians) and Cardinal Wolsey. He took his M.R.C.P. in 1873, was elected a Fellow in 1887, and held the high office of President from 1918 until the spring of 1922 when Sir Humphrey Rolleston succeeded him. He filled many of the lectureships of the College and following Dr. Frank Payne, that distinguished historian of medicine, he was its Harveian Librarian for seventeen years. There he could be seen every afternoon deeply engaged in the perusal of old medical lore or volumes of the classics, of which its library has so many valuable examples. Norman Moore did much to encourage the study of the history of medicine in England, and through his influence the Fitzpatrick lectures were founded; and when his turn came to deliver them at the Royal College of Physicians, he chose as his subject the *History of the Study of Medicine in the British Isles**. In this book we have a sympathetic study of many of the lesser known physicians as well as of the great men in British medicine. Moore shows that to Mayerne, Glisson, and Sydenham we owe the establishment of the study of clinical medicine in England. Scattered through the pages, we find the names of those who discovered facts or methods in clinical medicine, which are now common knowledge. For example, that Nicholas Tulpius in his three books of observations, printed by Louis Elzevir at Amsterdam in 1641, was the first to describe the sputa of fibrinous bronchitis; or that Nicholas de Cusa (xvth century) was the first to count the pulse, and this he did by the water-clock. Before his time the pulse had often been discussed, but never counted.

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*Oxford, at the Clarendon Press, 1908, 8 vo.

Sir Norman Moore was at one time President of the History of Medicine Section of the Royal Society of Medicine and in 1922 was President of Honour at the gathering of the third International Congress of the History of Medicine.

He represented the College on the General Medical Council for years. Although his leanings were conservative in matters of policy, he did not stand in the way of progress, and it is owing to his work and of those who were associated with him that the examinations of the Conjoined Board of the Royal Colleges of Physicians and Surgeons were established. Sir Norman Moore was far-famed as an after-dinner speaker at medical gatherings.

As a student of history and biography Norman Moore was indefatigable; for the *Dictionary of National Biography* he wrote four hundred and fifty-four lives, chiefly those of medical men. In the preparation for such a work he has said that he always read all that the subject of the biography had written before he attempted to present the life himself. Amongst his interests was the study of ancient Irish and many years ago Sir Norman Moore translated a grammar of the Irish language. For some years he was a Trustee of the British Museum and lent his counsel in matters concerning the purchase of antiquities. He also loved to go there for study and research in the immense library and in the manuscript room.

He was created a Baronet in 1919. One of his sons was killed in the war; he leaves a widow and another son, who is also a physician and an authority upon the history of sailing ships. A. M.

RUDYARD KIPLING AT THE ROYAL COLLEGE OF SURGEONS

At the Hunterian Festival of the Royal College of Surgeons a few weeks ago the Hunterian Oration was delivered by Sir John Bland-Sutton, and at the dinner in the evening the orator's health was proposed by Mr. Rudyard Kipling The speaker's words will be read with interest by all, for he relates a legend of man's desire to know the how and the why of the working of nature about him and in him, which has been felt down through the ages.

"Once upon a time, or rather at the very birth of time, when the Gods were so new that they had no names, and Man was still damp from the clay of the pit whence he had been digged, Man claimed that he, too, was in some sort a deity. The Gods weighed his evidence and decided that Man's claim was good—that he was, in effect, a divinity, and, as such, entitled to be freed from the trammels of mere brute instinct, to enjoy the consequence of his own acts. But the Gods sell everything at a price. Having conceded Man's claim, they came by stealth and stole away this godhead, with intent to hide it where Man should never find it again. But this was none so easy. If they hid it anywhere on Earth, Man, the inveterate hunter—the father of all hunters—would leave no stone unturned or wave unplumbed till he had recovered it. If they concealed it among themselves, they feared that Man might in the end batter his way up even to the skies. And, while they were all thus at a stand, the wisest of the Gods, who afterwards became the God Brahm, said, 'I know. Give it to me!' And he closed his hand upon the tiny unstable light of Man's stolen godhead, and when that great hand opened again the light was gone. 'All is well,' said Brahm. 'I have hidden it where Man will never dream of looking for it. I have hidden it inside Man himself.' 'Yes, but whereabouts inside Man have you hidden it?' all the other Gods asked. 'Ah,' said Brahm, 'that is my secret, and always will be unless and until Man discovers it for himself.'

"Thus, then, does the case stand with Man up to the present. Consider, for a moment, the pathos of the poor brute's position. You all know the common formula for him. 'Born of Woman, on Woman designed to beget his like—the natural quarry of the Seven Deadly Sins, but the Altar of an inextinguishable Hope.' Or, more scientifically (I regret I am not a scientific person), he might be defined as 'An imperfectly denatured animal intermittently subject to the unpredictable reactions of an unlocated spiritual area.'

"It is just this search for this unlocated spiritual area, whether it be a growth or a survival, which has preoccupied Man from that day to this. The Priest and the Lawgiver have probed and fished for it all through the ages; but, more than any other, through all the ages, the Leech, the Medicine-Man, the Healer, has been hottest on its track. He has searched, wherever he dared—openly or furtively—in safety or at the risk of his life. In the early days the Astrologer-Physician, as he called himself, dreamed that the secret of Man's eternal unrest was laid up in the sun, moon, and stars; and consequently, since all created things were one in essence, that a universal medicament for Man's eternal woes would be discovered upon earth. So he searched the earth and the Heavens for those twin secrets, and sacrificed himself in the search as a matter of course. Later, when the embargoes on the healing art were lifted, when, at last, he was permitted to look openly into the bodies of mankind, the nature of his dreams changed for a while. He had found more wonders beneath his knife than earth or the planets had heretofore shown him. And that was barely ten generations ago. Once again, the Surgeon, as he had become, renewed his search, and once again sacrificed himself in the search as his passion drove him. There is no anaesthesia so complete as man's absorption in his own job.

"In the teeth of the outrageous, the absurd disabilities imposed on him, Man, the imperfectly denatured animal, who cannot trust the evidence of his own senses in the simplest matter of fact; whose evidence on the simplest matter is coloured by his own iniquities; Man, always the hunter, went up against the darkness that cloaked him and every act of his being, to find out what order of created being he might be. He called it scientific research. It was the old quest under a new name. But, this time, the seekers who headed it, unlike the Priest and the Lawyer, admitted that they knew very little. Experience had taught them to be humble. For that reason their knowledge was increased. They moved forward into areas of the body, which, till then, had denied themselves to man's hand. They were bewildered by mysteries which some new marriage of observation upon accident, some predestined slip of the knife resolved into—mysteries profounder still! Is it any wonder that the old dreams came back? The dream of the essential unity of all created things—the dream that some day that which men called life might be led into matter which men called dead—the boldest dream of all, that eventually Man might surprise the ultimate secret of his being where Brahm had hidden it, in the body of Man. And, meanwhile, their days were filled, as yours are filled, with the piteous procession of men and women begging for leave to be allowed to live a little longer, upon whatever terms.

"Is it any wonder, gentlemen of the College of Surgeons, that your calling should exact the utmost that man can give—full knowledge, exquisite judgment, and skill in the highest, to be put forth, not at any self-chosen moment, but daily at the need of others? More than this. Your dread art demands the instant, impersonal vision which in one breath, one beat of the pulse, can automatically dismiss every preconceived idea and impression, and as automatically recognize, accept, and overcome whatever of new and unsuspected menace may have slid into the light beneath your steadfast hand."

Mr. Rudyard Kipling's story, about Culpeper, "A Doctor of Medicine" which is followed by the verses entitled, "Our Fathers of Old," is in *Rewards and Fairies*. Both have been widely read, but his address to the students of the Medical School of the Middlesex Hospital on October 1st, 1908, on *Doctors* (published by MacMillan & Co.), is not so well known. In simple, plain language Kipling tells the students of the obligations, of the privileges, and of the trials of those whose calling is to minister to the sick in body and in mind.

A. M.

Decline of Tuberculosis.—The Committee of Management of the Royal Victoria Hospital Tuberculosis Trust in its eighth annual report submitted statistics showing that the mortality from tuberculosis had fallen during the twenty-five years 1890-1915 by 30.9 per cent. in England and by 42.4 per cent. in Scotland. Tuberculosis had not been increased by the war, and in 1920 a further drop had taken place, which was maintained in 1921. During the past year this Trust had opened the Southfield Sanatorium Colony, which it was hoped would soon be expanded to one hundred beds.—Brit. Med. Journal, Mar. 10, 1923.

Therapeutical and Pharmaceutical Items

BUTYN

This local anaesthetic is a synthetic preparation with the technical name of Para-aminobenzoyl-gammadinormalbutylaminopropanol sulphate. In chemical constitution it resembles procaine of which two ethyl groups are replaced by those of butyl and propanol is substituted for ethanol.

It was submitted by the Abbott Laboratories to the Council of Pharmacy and Chemistry of the American Medical Association a few years ago. This Council supported the pharmacological investigation made by M. L. Bonar and Torald Sollmann[1] at the Western Reserve University, which shows that butyn is equally efficient for surface anaesthesia as cocaine and procaine in concentrations one-half those of the former and one-tenth of the latter; that it is non-irritating; has no effect on the blood vessels; and may be used with epinephrin. Intracutaneously its effective concentrations are about one-half those of cocaine or procaine, but its toxicity is about the same as that of cocaine or higher and considerably greater than that of procaine. They pointed out that it was likely to be useful for anaesthesia of intact mucous membranes and that for injection methods it had no important advantage over the less toxic procaine.

After this came a special report from the committee on local anæsthesia of the section on ophthalmology of the American Medical Association[2] stating that surface anaesthesia was produced in the eye in one minute after one instillation of a two per cent. solution and lasted from fifteen to twenty minutes. Increase in the number of instillations increases the quality and duration of the effect; with four instillations anaesthesia is sufficient for all operations on the eye except enucleation; this had not been done with butyn by any member of the committee; a mild hyperaemia is produced which is easily controlled by epinephrine; solutions of butyn have no effect on the diameter of the pupil nor on the intraocular pressure and they cause no drying of the cornea. Exposed to air, light and boiling, solutions of butyn are stable and remain efficient. None of the members of the committee have found any systemic toxic effects in hundreds of cases including operations on the eye, nose and throat. They believe this new preparation to be superior to cocaine in so far as instillation goes. With infiltration they are using one-half of one per cent. solutions but are not yet ready to make a report.

Following the results of these investigations the Council of Pharmacy and Chemistry of the American Medical Association accepted butyn as a local anaesthetic which may be used as a substitute for cocaine on the unbroken mucosa.

A very favourable report on butyn is given by Beaumont in a recent issue of the *British Medical Journal*[3].

From the available information it would seem that this new local anaesthetic agent is useful for surface effects and that caution should be exercised in its further application.

WESLEY BOURNE

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The Duration of Contagion in Whooping-cough.—Barbier and Renard (*Paris Méd.*, Dec. 9th, 1922, p. 531) have examined numerous children and adults before and after the paroxysmal stage of whooping-cough for Bordet's bacillus, and have come to the conclusion that whooping-cough patients are isolated for too long a period. In most cases children cease to be contagious after the paroxysms have lasted three weeks. They should, therefore, be allowed to return to school one month after the onset of the disease, instead of one month after the last paroxysm. The authors also maintain that abortive attacks occur, and that when a case of whooping-cough breaks out in a family the patient's brothers and sisters should also be examined, as they may be in the pre-paroxysmal stage, and thus constitute a source of infection in the school which they are attending.—*Brit. Med. Jour.*, Jan. 27, 1923.

Correspondence

OUR IMMIGRATION POLICY—A VISIT TO ELLIS ISLAND

A visit to Ellis Island, the entrance to the great American melting pot, nestling at the base of the Statue of Liberty, is an experience not likely to be forgotten by any student of human affairs, whether he be anthropologist, politician or philanthropist. Probably the proximity of the Goddess of Liberty beckoning to the degenerate hordes from Central Europe with a sort of "Come on boys, the United States are yours" expression, is at times embarrassing to the descendants of the signers of the Declaration of Independence who sagely declared that all men are born equal. This platitude has been found misleading and if you wish to learn what the best of the rapidly disappearing true Americans think of it, they will tell you that the framers of the Constitution did not mean what they wrote; they were only referring to themselves. At all events, the melting pot idea has fallen on evil days, and it has been discovered that there is a good deal of refractory material that will not melt, and even if it mixes, the new material formed does not acquire the virtues of the superior part of the *mélange*, but rather the weakness of the inferior ingredient. In other words, if you cross a negro with a white you simply produce negro descendants probably with the inferiorities of the race intensified. The authorities at Ellis Island give no uncertain sound, and the experienced officials look with apprehension on the future of the new American race, if such can be evolved from the pot-pourri representing what was expected to become the greatest nation on earth. So much new blood has been introduced that the best thinkers are prophesying that within fifty years the average American will be inferior to the past generations, physically and mentally. He will be dark skinned and dark eyed, three inches shorter in height, lighter boned, with less power of resistance and altogether just what a study of Mendelian laws and anthropology would expect him to be.

The laws of heredity are immutable, and much as the touters of the tremendous influence of environment, as opposed to those of heredity, have sung their paean, the whole history of the human race shows that facts and not sentimental theories prevail. They classify Central European races, particularly the descendants of the brachycephalic Alpine stock hopelessly inferior, as they have always been, and while they have some redeeming features yet in intelligence they fall so far below the Nordic or even Mediterranean types, that the Binet Simon scales are useless in measuring them. The same story reaches us from Saskatchewan, where an experienced psychiatric investigator says that all ordinary methods of study fail when considering these peoples.

The authorities agree with us in saying that the greatest menace of the mental defective exists in the admission of high grade morons, and it is almost impossible to exclude them on account of the methods employed by shyster lawyers and others to get them permits to remain in the country for six months. A most perfect system of defeating the end of justice exists, and this is fostered by the same difficulty which exists in Canada, that is, the Federal authorities are in the position at headquarters to override any decision made by a medical adviser, and to issue permits in spite of any protest that may be made. This leads to no end of trouble, with the result that many undesirables are admitted in spite of the most perfect precautions taken by the physicians at the port of entrance to prevent such admissions. To illustrate the difficulties of excluding high grade morons it may be said that a system of coaching these defectives while on a period of probation exists, and when they come up for their second examination if they are given the ordinary intelligence tests, they pass them with facility.

There is little trouble about the exclusion of the obviously insane, and no one seems to object to their return. We saw a good many of those who were being detained. Different forms of mechanical restraint exist, which, in our opinion, are decidedly objectionable.

Their interpreters are excellent, and are to be depended on for the simple reason that many of the physicians have acquired a good knowledge of foreign languages and can check them up if they wish to be dishonest.

Regarding child immigration they had not much to say, because no such thing as child immigration, as we know it, exists, but they can understand that it would be objectionable unless placed under rigid supervision.

The question of the examination of immigrants at ports *of embarkation* was thoroughly discussed, and they made objections that are practically unanswerable. These remarks apply to Canada as well as the United States. The ports are so many that it would require an enormous staff to meet the requirements,—a staff that would cost a great deal more than it was worth, and then the dangers of substitution are not by any means imaginary; as a psychiatrist said, one whiskered Russian looks so much like another whiskered Russian that substitution would be employed persistently, and they feel that the only plan is to have the examinations made at the port of landing.

All of the foregoing is of intense interest to Canadians as the hue and cry of the politicians is for more immigration always qualified by the statement—of the right type. Who is to select the right type! There's the rub. Surely not the steamship companies. Nor can it be done by the politicians whose knowledge of European types is generally *nil*; even many of the immigration officers are ill qualified for the task they are set out to accomplish.

A careful study of the immigration of a hundred years ago is full of interest, and the failure of our democracy to retain many of our best people in Canada points to the fact that if we had lavished as much attention on the question of the prevention of the emigration of good types out of Canada, instead of scouring Europe for a host of the questionable kind to enter our country, Canada would have been a much greater nation than it is to-day. However, there are two sides to the question, and if we can only persuade our government to limit its importations to people from countries free from suspicion of the limitation of low intelligence, we may still save an awkward situation. It seems to be able to limit Asiatic immigration by a bold policy, why not extend it in other directions? However, this is a big subject. A day spent at Ellis Island is an object lesson of intense interest to any Canadian who has pride of nationality and a desire for his country to occupy a high niche in the history of the world.

C. K. Clarke, M.D.

Toronto, March 1st, 1923.

MOTOR POWER IN NOSE AND THROAT OPERATIONS

To the Editor:

I have found that by drilling a hole in the manifold, (or intake) of a Ford car, and attaching it to a suction apparatus good results can be obtained in nose and throat operations.

The apparatus is simplicity itself, and has obvious advantages over the electrically operated pumps, or the ones operated by a faucet of running water.

(1) Many operations may be performed in houses where there is no current or running water.

(2) The electrically operated pump takes only one kind of current, and so, is often useless even with a current.

Into a hole bored and "tapped" into the manifold of a Ford car a ⅜-inch or ½-inch "pet cock" with a nozzle long enough to take a piece of rubber tubing is screwed. To this is attached the tube which exhausts the air from the vacuum jar of the suction apparatus. In all other ways the apparatus is the same as those in ordinary use.

It will go, and will work anywhere you can drive a car. Drive the car up to a window, pass the tube out of a window, open the pet cock, start the engine and the machine is in operation.

The idea originated in observing wind-shield cleaners operated by the same force.

Delhi, Ont. E. W. Zumstein, M.D.

March 16th, 1923.

CHANGES IN THE TEMPORAL BONES IN EXPERIMENTAL RICKETS.—In young rats which have been maintained on a diet low in fat-soluble vitamin A and in calcium, Arnold B. Kaufman, Frances Creekmur and Oscar T. Schultz, Chicago, found that there occur abnormalities of the osseous capsule of the internal ear which are identical with those changes in the long bones which are characteristic of experimental rickets. These alterations, since they occur in structures concerned in the function of hearing, may result in an impairment of hearing. The analogies between the changes in the temporal bones in experimental rickets and the lesions which have been described in otosclerosis suggest that the latter condition may be a late result of rickets or a manifestation of a dietary deficiency still existent during adult life.—*Jour. Am. Med. Ass.*, March 10, 1923.

SIR THOMAS GEORGE RODDICK

SIR THOMAS GEORGE RODDICK, M.D., LL.D., F.R.C.S. (Eng.)

I have been asked by several of his old colleagues to write a few appreciative lines on the late Sir Thomas Roddick, whose death, although not unexpected, when it came was a shock to his friends. I first knew him in 1869 when I entered medicine at McGill as a freshman. He was then Assistant House Surgeon to the Montreal General Hospital, Dr. George Ross being house surgeon, and Dr. T. Rodger, apothecary. This was then the whole resident staff of the hospital. Roddick had graduated the year before (1868) and was Holmes Gold Medalist. A short time later he was elected to the resident staff of the hospital. In these early days the house surgeons attended to all the out-door patients, and after the session was over I remained for three months to do work in the out-door department, and to follow Ross and Roddick in their visits to the wards: thus I learned from these two men more than I absorbed from the regular clinical teachers. It was the custom then for the House Surgeon to remain in the hospital for some years, in fact, until they had acquired sufficient outside practice to take a house, drive a horse, and become one of the practitioners of the city with the prestige of the hospital behind them. When the attending physicians were on a holiday their house surgeons attended to their practice. Dr. Fraser, who was Professor of Physiology, used to hand over his practice to Dr. Roddick when he was away from town, and every morning after the out-door service was over a smart equipage drawn by two lively horses would pull up at the hospital gates and Dr. Roddick would jump in and drive off to see Dr. Fraser's patients. This was an accepted custom. Also Dr. Fraser made use of his House Surgeon to exhibit to his class the circulation in the frog's foot. The only microscope I saw at that time was the one used by Dr. Roddick on these occasions (and they were not frequent). We all took our turns to look through the microscope and see the wonders revealed, and were much impressed.

A house surgeoncy in the hospital was a stepping stone to university appointments. When Ross left the hospital to become Professor of Clinical Medicine, Roddick took his place, and soon afterwards, in 1874, he, in his turn, was appointed Demonstrator of Anatomy. He was the last house surgeon to obtain a college appointment in this way. In 1875 he was appointed Professor of Clinical Surgery, and full surgeon to the hospital, succeeding Dr. George Fenwick, who became Professor of Surgery.

From the first Roddick brought a new spirit into the teaching of bedside surgery, he became most skilful as an operator, and renowned as a teacher. He had a wonderful facility in diagnosing and treating fractures, and his bandaging was a work of art. His love for his work, genial manner, and innate kindness of heart endeared him to all the students. His simple and impressive methods of teaching made him very popular, and he never taught over the heads of the students. Knowledge oozed out from him to his class, and never smelt of the lamp.

In 1877 he went to Edinburgh to study Lister's methods, and after residing there for some months returned with all the apparatus necessary for the Listerial "Ritual" as it was then called, *viz.*, spray, prepared gauzes, green protective, rubber wrapping, etc. He it was then who first introduced the antiseptic methods of Lister into Montreal, and, I fancy, into Canada. It certainly revolutionized the surgery of the General Hospital and banished erysipelas and hospital gangrene from the wards and reduced the mortality of operations to a minimum. Dr. Roddick was actively connected with the General Hospital for twenty-five years, and in that hospital did the work which gained for him such a wide reputation as a teacher and surgeon. In 1893 he took service in the Royal Victoria Hospital, just about to be opened, and organized its surgical department, but did little work there, this falling to his colleague and assistant, Dr. James Bell. Roddick was not a prolific writer, but many articles by him can be found in the *Canada Medical and Surgical Journal* and its successor *The Montreal Medical Journal*, also in Volume I of the *Montreal General Hospital Reports*. One article especially on Antiseptic Surgery is historically interesting. He was one of the editors of the *Montreal Medical Journal*. Dr. Roddick was one of that band of brilliant young teachers, who, stimulated by Osler in the '80's, brought such distinction and reputation to the Faculty of Medicine of McGill University. I might mention among his colleagues such men as George Ross, William Osler, F. Buller, William Gardner, and Richard Mac-

Donnell. Among the older men of distinction at this time were Palmer Howard, George Fenwick, and Robert Craik. Sir Thomas received many honours such as the LL.D. of Edinburgh, F.R.C.S. of England. He was offered the D.Sc. of Oxford, but was unable to attend the Convocation to receive it. He had held prominent positions, *viz.*, President of the Montreal Medico-Chirurgical Society, the Canadian Medical Association, Hon. President of the Medical Council of Canada, and last but not least, President of the British Medical Association, the first Canadian who received this honour. In 1896 he was elected for Montreal West to Parliament in the Conservative interest, and there promoted what was called the "Roddick Bill" after the passing of which the Government was enabled to appoint the Medical Council of Canada whose diploma enabled a man to practise in any part of the Dominion of Canada, and also to register in Great Britain and be eligible for the Medical Services of the Army and Navy. For this great work he will be long remembered. During the Riel Rebellion he organized the medical department of the expedition, and was surgeon-in-chief to the army in the field. Roddick was essentially of a sociable disposition and had much personal magnetism; he was much beloved by his patients and exercised considerable influence in the profession especially among the younger members for he always kept young himself. In the '80's he, with eleven others, formed a Medical Dining Club, which met once a month; he and Osler added much to the liveliness and entertainment of the Club.

Sir Thomas deserves well of his country, he was a distinguished man, worked with his whole soul, not only for his hospital, university and city, but for all Canada. He was one of the founders of the Red Cross and Victorian Order in Montreal. He influenced many generations of medical students, and his name will not soon be forgotten by the medical profession. He was Knighted in 1914 for distinguished services to his country and to the medical profession. He was twice married, the present Lady Roddick being a daughter of the late J. J. Redpath, of Montreal. He had no issue.

For the past few years he had been an invalid and spent his winters in the South. He was born in Harbour Grace, Newfoundland in 1846.

FRANCIS J. SHEPHERD

GLANDERS and rabies, two of the most horrible diseases that can affect man or beast, show what can be done by organized collaboration of the medical and the veterinary professions. Each is primarily a disease of animals, and comes to man only from them. Let the veterinary scientist eradicate glanders from his patients of the horse tribe, and rabies from the canine race, and neither of these diseases will appear in man. As evidence of this, the story of rabies in Great Britain is most instructive. Aided by their island location and adequate laws, the energetic watchfulness of the veterinary officials of the ministry of agriculture kept Great Britain free from rabies for nearly twenty years; and until some thoughtless person committed the stupid and criminal offense of surreptitiously smuggling a dog (which happened to be infected and in the incubative stage) into the country, the much dreaded disease existed in that country only in name. The first case was reported in the district of Plymouth about May, 1918, and in 1919 alone 179 persons were bitten by animals in the scheduled areas, forty-six of them by animals proved to be rabid. It is a triumphant tribute to the memory of Pasteur that there have been no deaths in England from hydrophobia since his day.

The record of glanders is not much less brilliant. Twenty years ago, 2,370 horses were destroyed in Great Britain for glanders in one year, whereas in the first half of 1922 no case was reported. Not a single case of human infection from glanders was reported in the British army during the war, despite the great amount of contact between men and horses. The mallein test is entitled to a large part of the credit for virtually eliminating glanders as a human disease. The foregoing examples emphasize the importance of the development of the field of comparative pathology or, better, of comparative medicine, in order that all progress made in one branch of pathology may find its application in the other branches without fail and without undue delay. *Jour. A.M.A.*, February 3rd, 1923.

Abstracts from Current Literature

MEDICINE

Protein Feeding and High Blood Pressure. Strouse, S., and Kelman, S. R. *Arch. Int Med.*, February, 1923, vol. 31, p. 151.

In view of the contradictory statements in the literature regarding the effect of high protein diet in the presence of hypertension, the authors present intensive studies on eleven cases of hypertension, with or without nephritis, taken from the medical wards. The blood pressure was determined twice daily and the average reading charted. The special diets which contained from 40 to 150 grammes of protein were given for periods of from three to nineteen days, and in certain cases coffee and soup were added during the high protein periods. They report that while cases of essential hypertension have a tendency to show marked variations of pressure, still these variations show little relation to the protein intake and the addition of soup and coffee fails to cause any noticeable change in the readings. So also in cases of frank nephritis, lowering of protein intake sufficient to cause marked reduction of the non-protein nitrogen of the blood, did not cause any fall in the blood pressure. The results are a direct confirmation of Mosenthal's findings. D. S. Lewis

The Carbon Dioxide and Oxygen Content of Stomach Gas in Normal Persons. Dunn, A. D., and Thompson, W. *Arch. Int. Med.*, January, 1923, vol. 31, p. 1.

Complaints of eructation of gas are of such common occurrence that the origin of the gas has aroused much speculation. It is generally accepted that, apart from air swallowed with the food and saliva, and by "air swallowers," the chief sources of stomach gases are fermentation and putrefaction. Dunn and Thompson show that the normal stomach contains usually less than 50 c.c. of gas, and that this gas consists of carbon dioxide, oxygen and nitrogen, the carbon dioxide forming in the neighbourhood of 5.5 per cent. of the total, and the oxygen about 17.5 per cent. They also find if room air (CO2, 0.04%: O2, 20.0%) be introduced into the stomach, and be withdrawn in one hour that it shows practically the same composition as gas ordinarily found in the normal stomach. In other words, carbon dioxide gradually passes through the gastric walls until the tension of this gas in the stomach approached that in the tissues and blood, while a corresponding but slower passage of oxygen occurs from the stomach towards the tissues, thus accounting for the lowered oxygen and raised carbon dioxide content of the gas. In no case did incubation of the stomach contents after removal, give rise to gas, so that fermentation can play but a slight rôle in the accumulation of gases in the stomach.

D. S. Lewis

Orthopnoea. Christie, C. D., and Beams, A. J. *Arch. Int. Med.*, January, 1923, vol. 31, p. 85.

Many theories have been advanced to explain the greater ease which dyspnoeic patients experience when in the sitting position as compared with that when lying down. It has been suggested that the upright posture allows of more efficient muscular activity or that the lower position of the abdominal viscera allows of a freer expiratory movement. Others have suggested that the sitting position in some way increases the size of the thoracic framework, and allows of a greater lung volume. Christie and Beams show by vital capacity measurements that in normal individuals the volume of air expired is 5.5 per cent. greater in the sitting than in the lying position in eighty per cent. of a large series, while in the remaining twenty per cent. the vital capacity is not affected or is even higher in the lying than in the sitting posture. In pathological conditions orthopnoea may be divided into two classes "orthopnoea of choice" and "orthopnoea of necessity." In the former the patient adopts this attitude by reason of greater comfort but can lie down if necessary, in the latter the orthopnoeic position is obligatory. In "orthopnoea of necessity" a sitting posture gives the necessary increase in vital capacity which is required to carry on the vital processes. This extra space represents the difference between the irreducible minimum and the level at which sufficient aeration of the blood is no longer possible.

D. S. Lewis

Toxic Manifestations Following the Alkaline Treatment of Peptic Ulcer. Herdt, L. L., and Rivers, A. B. *Arch. Int. Med.*, February, 1923, vol. 31, p. 171.

The Sippy regimen in the treatment of gastric ulcer is based in part on an attempt to neutralise the corrosive action of the gastric juice by the frequent administration of alkali powders. Herdt and Rivers at the Mayo Clinic report a series of cases in which this intensive treatment was followed by the development of a definite toxaemia associated with very definite changes in renal function and in the acid-base equilibrium of the blood. Clinical evidences of this toxaemia usually appeared during the second or third week of the treatment, the most characteristic symptoms being intense distaste for the diet, and especially for the powders, nausea, vomiting, vertigo, general malaise, and increasing prostration. Associated with these, they report a slowing of the respiratory rate, a quickening of the pulse, and sweating. With a stoppage of the alkali and increased diet the symptoms disappeared. Chemical studies of the blood in these cases showed a marked impairment of renal function with marked rise of the blood urea and creatinin, and an increased alkali reserve of the blood. They found evidences of this kidney damage on examination of the urine, casts and albumen being present where the urine had previously been free or markedly increased, where nephritis had been present at the initiation of treatment. They suggest that nephritics are more likely to develop this toxaemia than are those with undamaged kidneys. No definite relation between any particular metallic ion and the toxaemia could be identified.

D. S. Lewis

Alimentary Leukocytosis in Eighty Normal Men. Feinblatt, Henry M. *Jour. Amer. Med. Assoc.*, March 3rd, 1923.

In 1920, Widal, Abrami, and Iancovesco stated that a leucopenia following a standard protein meal was a delicate test for hepatic insufficiency. Their work was based upon control tests of eleven normal persons and sixteen patients in whom the liver was intact. This leucopenia, or *crise hémoclasique,* occurs if commercial peptone is injected into the blood stream of a normal dog. The leucopenia is accompanied by a fall in blood pressure, an increase in the coaguability of the blood, and a change in the refractive index of the serum, but the change in the leucocyte count is the most readily determined by a clinical test of these phenomena. In the dog after a heavy protein meal, proteose and peptone cannot be detected by a chemical test either in the portal vein or general circulation. By a biological reaction Widal was able to detect these substances in the blood of the portal vein, but not in the portal vein of an unfed dog. By making an anastomosis between the portal vein and the inferior vena cava a typical *crise hémoclasique* was brought about, but was absent in an unfed dog similarly treated. Therefore, the products of digestion, if they are unaltered by the liver, cause a leucopenia; this result was also obtained by injecting 40 c.c. of blood from the portal vein (taken after a protein meal) into the saphenous vein. Roch and Gautier, in 1922, achieved the same result by introducing ascitic fluid (a portal transudate), from a patient with Laennec's cirrhosis, into the general circulation, whereupon the number of leucocytes fell from 10,540 to 6,200.

The test has not obtained general confirmation. To establish the curve of normal leucocytosis after the ingestion of protein and to serve as a control for further work, Feinblatt has made the test on eighty healthy students. Five hours after the last meal a glass of milk is given and the leucocytes are counted; subsequent counts being made at half-hourly intervals. The curves obtained were so uniform that Feinblatt believes that his composite curve (constructed from all his results) gives the normal response to Widal's test of liver function. The average count immediately after taking the glass of milk was 7,379; a half an hour later it rose to 8,856; an hour later it was 9,762; after an hour and a half, 9,779; and two hours after the meal the average count was 9,191. The minimal rise in the number of leucocytes was about 700 and the maximal about 6,000.

Archibald Malloch

PEDIATRICS

Vulvovaginitis. Steen, I. F. *Surg. Gyn. and Obst.*, January, 1923.

Vulvovaginitis is an infection which frequently is gonorrhoeal in origin, but may, even in purulent varieties, be non-specific. Filth predisposes to the infection and may be the chief cause in milder cases. Diagnosis rests upon clinical evidence of the disease and smear examination made by an expert. Cultures are positive in only about fifty per cent. of gonorrhoeal cases, and are therefore not requisite. Given a case presenting the clinical picture of vulvovaginitis, and a smear presenting many pus cells, with diplococci having the typical gonococcal morphology, which are intracellular and gramme—negative, a positive diagnosis can be made.

Purulent cases should be vigorously treated. The best results are obtained by daily injections into the vagina of an ointment of one per cent. mercurochrome-220 in equal parts of lanolin and vaseline. A daily tub bath is an aid to local treatment and in mild non-gonorrhoeal cases is all that is required for cure. Determination of cure rests upon the disappearance of clinical evidence of the infection, three negative smears at intervals of one week after suspending treatment and a period of observation equal in time to the duration of the treatment. According to Treumith the average course of vulvovaginitis is four and one-half months. By the method recommended above an apparent cure was obtained in seven weeks—less than one-half the time. No complications were encountered.

L. M. Lindsay

The Action of Carbon Tetrachloride on the Liver. Doderty, J. F., and Burgess, E. *Brit. Med. Jour.*, November 11th, 1922.

In view of the report by Dr. W. G. Smillie and Dr. S. Pessoa to the effect that carbon tetrachloride in small doses produced a definite fatty degeneration of the liver and kidneys it was deemed advisable before advising the use of the drug as a vermifuge to ascertain whether a maximum dose of 5 c.c.m. was followed by these untoward effects. The drug was given with their personal consent to three prisoners condemned to die. It was given on an empty stomach followed by a meal of rice and later on by a saline purge. At the autopsy granular degeneration of the liver cells was found in each case, with cloudy swelling of the proximal tubes in the kidneys of one person. On this account it seems inadvisable to prescribe the drug in doses as large as 5 c.c.m. even when followed promptly by purgation. A safe maximum dose seems to be 3 c.c.m. since that amount has been given to a number of patients in Ceylon without producing any feeling of discomfort. As a vermifuge it seems to be effectual for the removal of both the round worm and thread worms, but is of less value in the treatment of other forms of intestinal parasites.

Carbon Tetrachlorid in the Treatment of Hookworm Disease. Lambert, S. M. *Jour. A.M.A.*, December 16th, 1922.

The Bureau of Ankylostomiasis of the Medical Department of the Colony of Fiji undertook to study the value of carbon tetrachlorid in the treatment of hookworm disease in human beings, and, during the period from February 14th to May 30th, 1922, administered the drug to more than 20,000 persons, the percentage of drug efficiency having been first established. The 20,000 treated persons were composed of 1 000 Europeans, 6,500 Indians and 13,000 Fijians. Original examination with the microscope revealed an infestation rate of eighty-nine per cent. among the Fijians and of ninety-three per cent. among the Indians. To date, reexamination has been made of 823 persons in this district, of whom seventy-two were found to be still infested. In the opinion of S. M. Lambert, this indicates that the single treatment method has reduced what was originally a 100 per cent. infestation to an infestation of less than nine per cent. The cost of each treatment was found to be fourpence halfpenny. The dose given was 0.2 c.c. (3 minims) to the year of age, up to the age of fifteen, when the adult dose of from 3 to 4 c.c. (from 45 to 60 minims) is reached. The maximum dose depends on the size of the adult. Carbon tetrachlorid, in the dosage given, is not so effective a vermifuge as oil of chenopodium for removing Ascaris, only forty per cent. of them being removed by the Fijian tests. The drug occasionally removes *Trichocephalus dispar* in small numbers. but it does not cure the disease. It seems, however, to remove *Oxyuris vermicularis* in large numbers. By no means the least valuable feature of carbon tetrachlorid treatment is the fact that, with it, it is easy to secure individual and public cooperation, as there is much less opposition to a campaign in which this drug is used than to one employing chenopodium or thymol. Rarely is there a refusal to take treatment. The dispensary in Suva, in response to public demand for treatment, opened two months before it had been planned to begin work in that district. In this preliminary period, 2,000 persons were treated at their own solicitation.

SURGERY

Teratomas and Their Relation to Age. Hinwich, H. E. *Jour. Cancer Res.*, October, 1921, vol. 6, p. 261.

A series of 975 cases were studied to ascertain their relationship to age. Growths of tridermal and bidermal origin only were considered. In addition, with the initial symptom as a guide. special efforts were made to establish the age of beginning development. In cases where this was not possible, the ages at operation or at death were taken as the closest approximation. Though there was considerable variation year by year, it was found possible to plot a definite curve.

From fertilization to the age of five there is an early rise to maximum. The curve then falls, and maintains a low point between five and eleven There then occurs a gradual rise which reaches its maximum between twenty-three and twenty-nine years. From that age there is a gradual fall, which ends at seventy-one years. Eighty-seven per cent. of teratomas occur before forty-one, and ninety-five per cent. before fifty-three. Since most congenital teratomas have no power of postnatal growth, the figures would then indicate that teratomas, capable of growth, most frequently develop between the ages of twenty-three and twenty-nine.

Teratomas are tridermal embryonal rests in which growth is potential. Growth of the individual retards or inhibits that of the teratoma. The potentiality of growth in the embryonal rest presents itself in two different phases: (1) Prenatal development, which continues until arrested by the excessive growth of the host. (2) Postnatal, or true potential growth which may persist until the growth of the host slows down or ceases, at which time it may actively develop. If prenatal inhibition occurs early, the embryonal rest will be small and less differentiated, but will be endowed with greater potential growth. If on the other hand, an embryonic rest attains a definite intra-uterine development, a large rest will result with little or no capacity for spontaneous growth. Teratomas of highest potential growth, which commence their development before that of their host has ceased, are not necessarily the most malignant because the growth of the host still presents inhibitory qualities. Most teratomas, however, possess a low potential growth and therefore do not develop until growth of the host ceases, at the ages between twenty-three and twenty-nine.

When trauma inaugurates growth, teratomas are more frequently malignant than those which proliferate by their potential growth alone, and are more frequently monodermal in character. If the inclusion remains undifferentiated, the cell is embryonic in type. If an injury occurs to an inclusion which has partially developed, the type of cell in many instances resembles that of acquired cancer. Since the age incidence of carcinoma testis presents a curve with rises and falls similar to that of teratoma testis and does not resemble that of senile cancer, there is a strong argument in favour of the theory that carcinoma testis is a one-sided teratoma. Similar tumours of the ovary have also in all probability a teratomatous origin.

Again, inhibition of the host in elderly people is negligible. Trauma occurring at that time of life may readily cause excessive growth in a teratoma. Thus, loss of growth restraint seems to be an important etiological factor in congenital inclusions and may also apply to acquired cancer

H. Maitland Young

A Contribution to Blood-Vessel Surgery. Gunshot Wound of the Common Femoral Artery. Successful End-to-End Anastomosis. Ellars, L. Ray. *Inter. Jour. Surg.*, October, 1922, vol. 35, p. 344.

The clinical and experimental progress of blood-vessel surgery as well as the improvement in operative technique are historically described. Vasal suture should not be attempted (1) in the presence of infection, (2) when excessive tension between vessel ends would tend to produce destruction of a considerable segment, (3) if prolonged operation is dangerous, (4) if damage to the vessel is too extensive, (5) if the injured vessel cannot be safely reached (6) in the presence of marked arterio-sclerosis, (7) military "field surgery."

A revolver shot entered the midline of the thigh of a man twenty-two years old. The wound was 2.5 inches below Poupart's ligament. The bullet lodged beneath the skin just above the ischial tuberosity. He was confined to bed for three weeks but, while walking during convalescence, he suffered constant pain in the upper part of the thigh. A tumour developed which gradually enlarged and possessed a purring thrill and expansile pulsation. In hospital, the leg was found to be swollen, cold and pallid. The veins of the leg appeared empty and no arterial pulsation could be felt below the level of the tumour. Operation was performed 217 days later and the right external iliac artery was compressed by rubbered clamps through the abdominal route. The artery was double the size of the one on the left. Exploring the wound in the thigh, the deep femoral artery was found completely severed near its bifurcation and in addition the common femoral divided through three-fourths of its diameter. The deep artery was ligated. Division of the common femoral artery was completed and two serrefines were applied one and one-half inches above and below. The adventitia was drawn over the end of each, trimmed evenly, and the wound flooded with oil. By the aid of three guy sutures which gave the vessel a triangular shape, the broad surfaces were sutured by a harness-maker's stitch with No. 00000 silk. The anastomosis was reinforced by a band of fascia lata. Complete recovery followed.

The second case was one of gunshot wound in the midline of the thigh half an inch below Poupart's ligament. The patient was in shock and the affected extremity was pulseless. The common femoral artery, at operation, was found almost wholly severed. By a similar procedure an end-to-end anastomosis was attempted but when the clamp was removed from the external iliac artery the suture-line would not hold and ligation was necessary. Treated expectantly, dry gangrene of the plantar surface of three toes followed together with ischemic myositis of the calf muscles and toe-drop. Tenotomy of the tendo achillis however, enabled the patient to walk comfortably. H. Maitland Young

The Results of Palliative Trephining in Brain Pressure. Anschutz, Deutsch. *Med. Wchnschr. Leipsic*, October 20th, 1922, vol. 48, p. 1,406.

When symptoms of brain pressure are present, lumbar puncture and internal treatment having failed to bring the desired results, palliative trephining is indicated, provided, of course, that a radical operation is out of the question. Harvey Cushing's subtemporal decompression is the operation of choice. The author describes a modification of this procedure designed to prevent brain hernia. He inserts muscle sutures before opening the dura and ties them immediately afterward. The trephining is done on both sides except when discretion decrees otherwise.

Fifty cases of palliative trephining were observed for a long time following operation. Syphilis was the cause of brain pressure in two cases, tumour in seven (confirmed by necropsy) undetermined twenty-one (one negative finding at post mortem). Clinically the cases are grouped according to the degree of cerebro-spinal pressure.

The results of the operation were judged by the preservation of life and sight. The fearful headache, vomiting and dizziness, as a rule vanished much more rapidly than the choked disc. This enabled the patient to partially resume his work much more promptly, and added much to his own comfort. In cases with very high cerebro-spinal pressures and prolonged coma, the operative risk was great. Slight improvement only was obtained in rapidly growing malignant tumours. In tumours of slower development, the procedure prolonged life and retarded blindness. The best results were obtained in a group composed of benign or malignant processes whose development was quiescent or retrograde. In these, early and timely trephining saved life, preserved and even partially regained vision and the patients were able to resume at least part of their daily routine.

H. Maitland Young

ANAESTHETICS

Acetonitrile Test for Thyroid and of Some Alterations of Metabolism. Reid, Hunt. *Am. Jour. of Physiol.*, January, 1923, vol. 63, No. 2.

The test depends on the marked and specifically increased resistance of mice to acetonitrile (methyl cyanide) when they have been treated with thyroid. In other animals the resistance is lowered. In the toxicity of methyl cyanide there are two actions; the immediate is narcotic and due to the methyl group, the later action is due to the liberation of hydrocyanic acid. This dissociation is brought about by hydrolysis and oxidation. Any increase in oxidation processes is accompanied by decreased resistance to acetonitrile in all animals with the one exception of mice which have had their basal metabolism raised by thyroid only.

To ensure reliable results many factors of control must be observed but the most particular of these is that of the diet. A full discussion of this is given and it is pointed out that mice in one batch may be made forty times more resistant than in another batch by changing the diet. The practical applications of the test are as follows: (1) To detect minute amounts of thyroid; (2) To determine the relation between physiological activity and iodine content; (3) To study the iodization of the thyroid in vivo; (4) And to compare the physiological activity of the thyroids of various animals and of various derivatives of thyroid and other iodine compounds.

He reviews the previous work on the subject and gives an exhaustive account of his methods. Applying this test to thyroxin he shows that this has the same qualitative action as thyroid and that its quantitative action is much greater than any other iodine-containing substance except thyroid which latter is one and one-half times as active as thyroxin. The reason for this is not yet known. He finds that blood from cases of hyperthyroidism protects mice markedly against acetonitrile. WESLEY BOURNE

Choosing Anaesthesia for General Surgery.

Hayes, J. M. *Minnesota Medicine*, January 1923, p. 29.

This paper commences with an indictment of general anaesthesia. Where possible the writer thinks local or regional anaesthesia should be used. Special skill is required in giving and operating under these methods.

Regional anaesthesia includes lumbar, sacral, paravertebral and splanchnic anaesthesia.

Deaths have occurred under paravertebral anaesthesia for goitre and under high sacral anaesthesia. Some of the deaths were due to faulty technique.

Posterior splanchnic anaesthesia, as developed by Kappes and others, is very satisfactory, if properly administered, in resections of the stomach or intestine, gastro-enterostomies, splenectomies. Considerable damage may be done by the inexperienced or by those who have not a thorough knowledge of the anatomy of the area. After explaining the technique the writer remarks that the method requires considerable practice and that at times the most skilful will fail to get good results.

Paravertebral anaesthesia is difficult, but when successfully administered is one of the safest and most satisfactory of methods. The technique of this and of sacral anaesthesia are explained, as is that of the spinal method.

The patient's tolerance of novocaine should be tested before operation, as some patients have an idiosyncracy for it. W. B. HOWELL

A Technique of Spinal Anaesthesia for Laparotomy.

Lane, S. A. *Lancet*, January 20th, 1923, p. 129.

The patient is not told the hour of operation. He is placed on a wheeled stretcher and put in a quiet room. Hyoscine gr. 1/100, morphia gr. 1/6, and atropine gr. 1/150 are given hypodermically and the patient is encouraged to sleep. Ten minutes before operation, if the patient is not asleep or drowsy a further hypodermic of hyoscine gr. 1/450 is given. Smoked glasses are put on and the ears are plugged with cotton wool before the patient is wheeled into the operating room. The injection is given in the sitting posture and the patient is then lowered into the Trendelenburg position. The table is levelled, if the operation requires it, as soon as the anaesthesia has reached the costal margin. Should there be straining, a return of sensation, or if the patient wakes up, a general anaesthetic is given in addition. Warmed ether given with Shipway's apparatus is used.

The following points are emphasized by the writer. By using this method there is much less anxiety beforehand. Some of the patients are unaware that an operation has been done. There is no headache afterward and no post-anaesthetic vomiting. In critical cases there need be no undue haste to "save the anaesthetic" as one can rely on forty-five minutes anaesthesia. The prognosis is improved. The patient can take water or glucose by the mouth after operation instead of rectal salines. The special solution used by the writer is stovaine and glucose five per cent. In adults the dose used is 2 c.c.

W. B. HOWELL

Studies in Experimental Traumatic Shock VI. The Action of Ether on the Circulation in Traumatic Shock.

Cattell, McKeen. *Arch. of Surg.*, January, 1923, p. 41.

Ether properly administered to normal subjects, causes at first a slight rise in blood pressure or no change at all. The blood pressure is maintained during operation at a uniform level or else there is a slight fall. Chloroform causes a definite fall.

During shock the circulatory system is very sensitive to ether. Blood pressure falls and collapse may occur.

In normal cats there is usually a sharp primary fall of blood pressure, at the beginning of inhalation, which is usually though not always followed by a gradual recovery as anaesthesia deepens and the eye reflex disappears. If the administration is pressed beyond a certain point, a second fall takes place and this may shortly be followed by death. In some cats there is a continuous fall of blood pressure from the beginning, so that ether has to be discontinued before deep anaesthesia is obtained. This occurs constantly in shocked animals, and is, with them, a sign of increased sensitiveness to ether.

With nitrous oxide and oxygen on the other hand, it is possible to induce, in shocked animals, a full degree of anaesthesia, without any further fall in blood pressure. This is true only when the mixture is administered with a large proportion of oxygen (one part of oxygen to three or four parts of nitrous oxide.) Experimental evidence suggests that the preliminary fall of blood pressure is due to a relaxation of the tone of the heart muscle. This becomes greater as anaesthesia deepens. There is no dilatation of the blood vessels at this stage. There may even be constriction. The vagus modifies to some extent, the changes in blood pressure resulting from the administration of ether. Animals with cut vagi, or those which are under the influence of atropine, can stand more ether than when the vagi are intact.

Epinephrin injected into the circulation also causes a marked loss of sensitiveness to ether. This is probably due to its action on the heart.

The effect of ether on the blood vessels in ordinary anaesthesia is to cause vasoconstriction, either by reflex stimulation of the vasomotor centre brought about by the fall of blood pressure, due to the lessened heart action, or to direct stimulation of the centre by ether.

In shock, the fact that the primary fall of blood pressure is no longer followed by recovery, suggests that the normal functioning of the vasomotor centre has been impaired and that there is no compensation for the decreased activity of the heart. Possibly the peripheral vessels are already so constricted that no further contraction can take place. Anything which interferes with the circulation so as to produce a low blood pressure for a period of an hour or more will cause increased sensitiveness to ether. The same effect is obtained by injecting acid into the circulation and as a result of haemorrhage. Probably the low pressure causes deficient oxidation of the tissues with consequent depression of the nervous centres.

W. B. Howell

The Effect of Anaesthetics on the Lungs.

McDowell, R. J. S. *B.M.J.*, January 13th, 1923.

The author makes a preliminary report of an investigation of the extent of the impairment of the functional activity of the lung tissue by anaesthesia. Distinction is drawn between the mere irritant action of the vapours and the more serious effects on the lung tissue. He considers that in the past the function of the bronchial muscles has been neglected and that our limited knowledge of the physiology of the pulmonary circulation is largely due to the experimental difficulty involved. He has shown that the effect of drugs on the pulmonary circulation is lessened in direct proportion to the depths of anaesthesia and gives some results which show that there is an actual death of tissue in the lungs after exposure to anaesthetics.

He claims to have demonstrated that the action of epinephrine on the bronchioles may be prevented by deep anaesthesia and in this connection quotes Brodie and Dixon on the inhibition of vagus constriction of the bronchioles in profound narcosis. This causes increased exposure of the alveoli. It is urged that deep or prolonged anaesthesia with ether and especially with chloroform should be avoided and that narcotics should be more extensively used to supplement them.

Wesley Bourne

The following lines were written by Dr. R. F. Rooney, graduate of McGill University, who commenced the practice of medicine in 1866, and is now settled in Auburn, California. In an address delivered in Coronado, he refers to the years of his medical life as having been epochal and covering the great majority of the wonderful discoveries and advances in medicine and surgery, an age also prolific in fads and cults. He ended an excellent address by the following verses written by himself, and read before a few confrères at a dinner in Coronado.

THE OLD PRACTITIONER

The old Doctor's getting older every year.
We watch his failing powers, year by year.
His step is growing slower;
His head is bowing lower,
And we note his lessening vigour, year by year.

His eyes are growing dimmer, year by year.
His legs are getting slimmer, year by year.
He has a tremble in his voice,
And his breath it makes more noise,
As he toddles down life's pathway, year by year.

If you think he is down and whining, with his years,
You've got another think a-coming, for this year.
For he's just as good at poker,
And the same old jolly joker;
He's a fighter from away back, through the years.

His mind is, maybe, duller, year by year.
But his experience is fuller, every year.
In his finger-ends an eye,
That your inner ills can spy,
And he makes better diagnoses, every year.

When the young men make their blunders, all the years,
The old cock stands by and wonders year by year,
At the things they think they know,
That so surely are not so,
And knows that they'll grow wiser with each year.

So he's growing old and older, every year.
He sees his finish nearer, every year.
Gray hairs are getting thicker
Has less capacity for liquor,
And he's worse and worse a kicker, every year.

In his every fault we love him— through the years
There are none that rank above him, in the years.
Soon the Lord will call upon him,
With his good and bad traits on him,
And he'll go to join his fathers for all the years.

News Items

GENERAL NEWS

Sir Alfred Yarrow, who is famous as a pioneer in the design and construction of high-speed vessels and head of the well known shipping firm on the Clyde, has just made a splendid gift of £100,000 to the Royal Society to be used in promoting scientific research. The terms of the gift, conveyed in a letter to Sir Charles Sherrington, President of the Royal Society are not rigid, and it is seen that the donor appreciates the fact that conditions may change in the future. The fund is to be administered for the Society "by the best people from time to time available," care is to be taken that a gift from a fund shall never lessen any Government grant, and rules for the guidance of the committee appointed to administer the fund shall be reconsidered by the Council of the Society every tenth year to meet needs of future years as they become apparent. Sir Alfred Yarrow writes, "I should prefer that the money be used to aid scientific workers by adequate payment, and by the supply of apparatus or other facilities, rather than to erect costly buildings, because large sums of money are sometimes spent on buildings without adequate endowment, and the investigators are embarrassed by financial anxieties." In closing the letter he states his "firm conviction that a patriotic citizen cannot give money or leave it at his death, to better advantage than towards the development of science." Sir Alfred Yarrow has already provided the National Physical Laboratory with funds for the erection of its ship-model tank and only the other day established at Cambridge a studentship in Assyriology in memory of one of his sons killed in the war. It is our fond hope that some of the rich citizens of Canada may soon follow the lead of Sir Alfred Yarrow in donating funds to promote and make possible scientific investigations.

The thirty-sixth Congress of the French Society of Ophthalmology will take place at Strassburg on Monday, June 11th and the following days. A report on the subject of conjunctival medication will be presented by Dr. Van Lint (of Brussels). On account of the Pasteur Centennial celebrations, the French Railway authorities will give a reduction of fifty per cent. (on railway charges) to Members of the Congress. Visits to the Hospitals, to the Hygiene Exhibit and Excursions to Calmar, in the Vosges, and to Saint Odile, will be organized to start on Saturday, June 9th. Details of the programme will be published later. For further information address Dr. René Onfray, secretaire general de la Société Fran'caise d'Ophthalmologie, 6 Avenue de la Motte, Picquet, Paris VII.

On the necessity for Periodic Health Examination in Industry was the subject of a lecture delivered by Dr. Haven R. Emerson, professor of public health administration, Columbia University, in the Windsor Hotel before a large gathering of business and professional men. Infant mortality is a problem facing physicians. Some have been under the presumption that protection of healthy children is the solution. In disagreeing, the speaker pointed to the fact that infants' diseases have been cured without much difficulty. The care of mothers before and after child birth is one of the great factors in the solving of the mortality, he went on. The lack of sanitary buildings has given rise to investigation by medical authorities. The work so far in its infancy has brought out many matters that have been hidden. No group of people in any community can be found to be perfectly sound. It is the previously undetected troubles that are the main cause for the agitation for examination. That examination is a real one. Still another phase of the examination, that is when trouble has been found, is the study of the individual's work; the analysis of his "daily routine." Is he or she suited to that work? Is there any other work that he or she could do that would be better for self and better for employers? How can the environment be improved? What would the influence of that improvement bring? Examination, he said, has induced people to act according to the programme prescribed for cure and prevention. "The employer that should be called upon to prescribe such examinations for his people is a governor. The question is a vital one requiring the support of all right thinking men and women," he said in conclusion. Dean Armstrong of the McGill Medical Faculty presided.

Plant Sanitation of Cash Value to Whole Community.—The direct value in dollars and cents accruing to employers and industrial organizations from the maintenance of the strictest sanitation in their plants, was the principle theme of the address by Dr. George C. Whipple, Professor of Sanitary Engineering at Harvard University, before a gathering of business men of the city. Professor Whipple described *en passant* the work done at Harvard University, where their department of Public Health was turning out a class of specially trained doctors, destined to care for the hygiene of the workers in big industrial establishments; the engineering school was also turning out an equally capable body of sanitary engineers and sanitary chemists, trained to bring to bear their special knowledge of the principles of chemistry and engineering respectively on the problems of public health and sanitation as applied to masses of workers in large industrial establishments. Lack of satisfactory sanitary conditions influenced the health and morale of the workers, the doctor said, and in this way ultimately influence the cost of running the plant, by its effect on absenteeism and on turnover. By the latter term was meant, the frequency with which men left their work and had to be replaced by others. There was also the reduction of injury and the increase in the efficiency of labour.

Victor Horsley Memorial Lecture.—It will be remembered that a committee was formed in 1900 by the friends and colleagues of Sir Victor Horsley to take steps to commemorate his services to science by the foundation of a lectureship or scholarship bearing his name. The tragic circumstances of his untimely death while on service with the army in Mesopotamia, on July 16th, 1916, are still fresh in memory. He was a pioneer in the research work connected with the surgery of the brain and nervous system, and brilliantly applied his own observations to the alleviation of conditions due to lesions of the brain and spinal cord, especially those produced by tumours and trauma. He was also one of the earliest to study the relation of the thyroid gland to myxoedema, and his investigations of rabies were of the utmost value as proving the possibility of stamping out the disease in Great Britain. Subscriptions were received by the committee from all over the world, and a sum of over £1,000 was collected. The committee, over which Sir Charles Ballance, K.C.M.G., F.R.C.S., presided, and of which Sir Frederick Mott, M.D., F.R.S , was treasurer, resolved that the sum should be invested in the name of a board of trustees, who should triennially appoint a person to deliver a lecture in London under the title of the Victor Horsley Memorial Lecture. We are now informed by Mr. Edward Domville, who was one of the secretaries of the committee that Sir Edward Sharpey Schafer, Professor of Physiology in the University of Edinburgh, has accepted the invitation of the trustees to be the first lecturer, and that the lecture will probably be delivered in the autumn.

NOVA SCOTIA

During the month Dr. Mallory, of Toronto, examined into the details of the pre-school age dental clinic prior to moving from Canada to London, England.

Dr. J. G. MacDougall, of Halifax, Dr. Ross Miller, of Amherst, and Dr. I. M. Lovitt, of Yarmouth, joined the delegation of Fellows of the American College of Surgeons for a seven weeks' trip to South America, sailing from New York City on February 10th.

Nova Scotia physicians have long taken an active part in public life. Dr. E. DuVernet, of Digby, Dr. C. S. Marshall, of Bridgewater, and Dr. G. W. Whitman, of Stellarton, are following in the footsteps of their predecessors, and each have been selected for mayoralty in their respective towns. Each of these physicians at some time served as Medical Health Officer of the town in which he resided.

Dr. H. G. Grant, who has been conducting a clinic in the tuberculosis service of Health Centre No. 1 since November, 1920, has withdrawn from service in order to devote his time to private practice and teaching at the University. Dr. Grant was succeeded on the first of March by Dr. S. H. Keshen, formerly anaesthetist at the Health Centre.

The Executive Officer of the Massachusetts-Halifax Health Commission has been utilizing the statistics of Halifax for the year ending September 30th, 1922, as a graphic lesson to the public. Charts, graphs, and figures showing the decline in infant death rate and general death rate were used in talks before the Progressive Club, the Life Underwriters, the American Legion, and at the annual meeting of the V.O.N. in Dartmouth, as well as in an article in the lay press. B. F. R.

Mrs. Sylvia Pankhurst, who has been doing work in several campaigns for lessening the prevalence of venereal disease in various sections of Canada, will spend the week, beginning April 8th, in the Province of Nova Scotia. Mass meetings will be held in at least two places in the city of Halifax on Sunday, the 8th. Further public meetings will be held on the 9th and 10th, after which Mrs. Pankhurst will visit various places in the province, and address meetings along the same lines.

We have received a statement regarding the course in Public Health nursing, to be established in Dalhousie University, for the purpose of preparing graduate trained nurses for the rapidly developing field of public health nurse. The University is fortunate in having the full co-operation of the Provincial Department of Health, the Nova Scotia Red Cross Society, the Massachusetts-Halifax Health Commission, the Public School authorities and the Victorian Order of Nurses, to assist in developing this most important course. Diplomas will be given upon the completion of the course, to all candidates who are successful in the examination to be held at the close of the course.

Health Centre activities of the Massachusetts-Halifax Health Commission continue to interest the public of Halifax and Dartmouth. For February, 3,374 home instructional visits were made by public health nurses and visiting house-keepers to a total of more than twenty-one hundred homes. Nearly a thousand of these families are not receiving medical or dental service at the clinics of the Health Centre, but are continuously under the supervision of the trained workers from the Centres. During February, 1,017 babies under two years of age were being supervised by the Health Centre staff in their homes. The medical activities of the Health Centre show a total of 929 medical, dental, and nursing consultations, more than half of these being in the nutrition classes. In eighty-two instances during the month, nurses found conditions in the home which required calling of the family physician, and due to the insistence of the nurses, doctors were called in.

Pending the completion of the new health centre being built by Dalhousie University out of the Rockefeller fund, the fifth year medical students have begun studying ambulatory patients at the Monday and Saturday afternoon clinics of Health Centre No. 1 in old Admiralty House. They are also having special clinics in certain of the city institutions. On Monday of each week clinics are being conducted in the Baby Welfare and Prenatal service of Health Centre No. 1 at four o'clock by Dr. Gordon B. Wiswell, and in the Nose and Throat service by Dr. S. J. McLennan; the two groups of students merging at five o'clock for the Venereal Disease clinic conducted by Dr. Glen Donovan. Another group of the class at the same time attend clinics in the Home of the Guardian Angel under Dr. D. G. J. Campbell. Each Saturday afternoon clinics on Tuberculosis for students are conducted at the Health Centre by Dr. T. M. Sieniewicz and Nutrition classes by Dr. F. W. Tidmarsh.

NEW BRUNSWICK

The largest and most successful meeting in the history of the New Brunswick Medical Society, is the slogan for the 1923 meeting to be held in Woodstock and Houlton on June 6-7-8. Physicians from all over the province have already signified their intention of being present and the large meeting already assured augurs well for the future success of the provincial society. The meetings will be held in conjunction with our *confrères* of the State of Maine and it is hoped that the getting together of the two societies will result in even closer cooperation between the physicians on the two sides of the international boundary. The same aims, the same ideals, the same work, the same difficulties are common to the members of both societies and it is felt that the papers presented will be of interest and benefit to all who attend. Prominent outside speakers have been arranged for and the social side of the meeting is in the capable hands of the Aroostook County profession.

A supply of insulin that was procured by our Minister of Health, Hon. Dr. Roberts, is now being used in the St. John Hospital. One of the patients after five weeks treatment, in speaking to the writer expressed himself as thoroughly satisfied with the progress he has made, and the laboratory reports show a continuous decline in the sugar content of the blood, in spite of the fact that the diet, especially the carbohydrates, has been greatly increased in amount. It is an unfortunate fact that the public look on the new remedy as a cure for diabetes. While not familiar with the expectations of the originators of insulin, we feel that until such time as research and pathological examination has demonstrated the regeneration of the Islands of Langerhans, destroyed in diabetes, we should classify the new treatment with ovarian and other organic extracts which exhibit a marked specific action only during the time they are being administered. In other words, all that we can claim for insulin is that it ameliorates or suspends the destructive action of diabetes during the treatment; that it will cure the disease seems highly improbable.

The formal opening of the new epidemic hospital connected with the General Public Hospital, St. John, marks the completion of a new link in the long chain of improvements undertaken to make the St. John hospital thoroughly up-to-date. Built on the most improved cubicle system, the new building with the remodelled old one is the last word in the construction of infectious hospitals. No expense has been spared in equipping it and the precautions taken to guard against cross infections are sure to remove the stigma that was inseparable from the old building. It is thought that the so-called 'private' patients will take advantage of the facilities now afforded them for modern treatment, and if such proves to be the case the community will profit by the more strict supervision of infectious cases, the hospital will benefit by increased revenue and the patients themselves will not only receive better and more scientific attention, but will also cease to be the menace to their friends that they have been in the immediate past. The new Out-Door department rapidly nearing completion will mark the end of the building improvements for the present and in addition to bringing this important part of a modern hospital up-to-date, will afford ample room for the utilization of the new x-ray apparatus that has been recently purchased. Under Dr. A. M. Kirkland this department has greatly increased its scope and usefulness and it is thought that the growth of x-ray therapy in a short time will tax even the increased accommodation that has been provided for it.

Following a particularly interesting and instructive evening devoted to x-ray work and demonstrations by Drs. H. A. Ferris and A. M. Kirkland, the resurrection and rejuvenation of the St. John Medical Society was undertaken by the members of the profession present. For many years this society was most popular and its members profited by it both professionally and socially. The war, the necessity of attending standardization meetings in two hospitals monthly—and perhaps the lack of pep in the last officers allowed the society to fall into oblivion whence it is to be dragged forth and, we hope, flourish as of old. The absence of a really representative society has been felt on several occasions lately; undoubtedly the profession needs a society that can work in its interests and speak authoritatively in its name. While largely dependent on men who have hospital affiliations it is open to all members of the profession in good standing and quite apart from its scientific aims and advantages, and they are many, such a medical society is the most democratic and most independent method of expressing the views of the physicians of a locality. E. J. R

QUEBEC

Dr. J. Roddick Byers, who until recently was Medical Superintendent of the Laurentian Sanatorium for Tuberculosis at St. Agathe des Monts has returned to Montreal and purposes to practice as consultant on diseases of the lungs. He holds the position of Medical Officer in Charge of the Tuberculosis Clinic of the Department of Soldiers Civil Re-Establishment at Unit Headquarters, Montreal.

Open New Clinic for Baby Welfare.—The Child Welfare Association of Montreal in its efforts to reduce its high infant mortality rate has opened up its fourth prenatal clinic for the purpose of aiding expectant mothers. Obstetricians of the highest standing are in charge of the medical work of these pre-natal clinics. Patients who attend these clinics are visited by the health centre nurses, at their homes, who instruct them on matter of daily health and see that no unfavourable symptoms are unreported to their physician.

Veteron McGill Graduate Dead.—News of the death of one of the oldest living graduates of McGill University, Dr. Clinton Wayne Kelly, a graduate in medicine fifty-six years ago, has been received by the Graduate Society of McGill. Dr. Kelly settled in Louisville, Ky., where he acquired a high reputation as a surgeon and became professor of anatomy in the University of Louisville. He was honoured by the McGill Alumni of Chicago who held a special celebration on his attainment of the fiftieth anniversary of his graduation. Only four members of the class in Medicine of '67 still survive.

Dr. Armstrong to Leave McGill.—Dr. George E. Armstrong, professor of surgery and clinical surgery at McGill University, has resigned. His resignation has not yet been accepted by the university authorities. Dr. Armstrong states that it will be impossible for him to continue in his position with the university beyond the present session. The reason for withdrawing from his university labours he gives is the impossibility of continuing in the dual position of university professor as well as surgeon-in-chief of the Royal Victoria Hospital, the combined duties having become too arduous. The name of Sir Henry Gray, who was a recent visitor to Montreal, has been freely mentioned in connection with the position of successor to Dr. Armstrong, but up to the present no announcement has been made as to his acceptance of the post. Dr. Armstrong pointed out that while he will for the present retain his position as surgeon-in-chief of Royal Victoria Hospital, he has made it clear that he will be ready to relinquish that post as soon as a successor suitable to both the university and the hospital authorities can be found to take his place.

Vaccine Pioneer had Stirring Days.—Dr. Louis Laberge, former chief medical officer of the City of Montreal, died recently at the age of seventy-one. Dr. Laberge was a strong believer in vaccination when it was mistrusted by the public. He thrice narrowly escaped being murdered for his views. On one occasion a bullet passed through his silk hat. Dr. Laberge had the satisfaction of living to see vaccination accepted by both city and province. Born in Montreal in 1851, he received his education at the Terrebonne College, St. Therese College, St. Mary's College and Victoria University. He graduated as M.D. in 1874. Practicing in Montreal, Dr. Laberge was appointed a member of the city vaccination service and in 1885 became medical health officer for the city. He represented Montreal at the International Congress of Hygiene in Paris in 1889; at the Medical Convention, Glasgow, Scotland, in 1901, and at the Tuberculosis Congress in Washington in 1908. He was best known for his work during the smallpox epidemic of 1885, when he brought vaccination into full action against the deadly disease and did much to stamp it out. Dr. Laberge is survived by his wife and by two sisters, both of Montreal.

Medical Course Extended One Year.—All students entering McGill University to train in medicine after next September, will enter for a seven years' course, according to the decision reached at a meeting of the Corporation of the University. The first two years of the prospective medical man will be spent in the Arts Faculty, where a revised course will be given with special attention to languages. The next four years will be spent as a student in the Medical Faculty, and the final year will be absorbed by a year's training in hospital. Special regulations are laid down concerning the course to be followed by the medical students in the two years spent in the Faculty of Arts.

Mechanics will not be taken, and additional instruction beyond that given to Arts students will be given in chemistry. In the second year, although the medical student will be under the control of the Faculty of Arts his destinies will be watched over by an advisory committee consisting of professors giving the courses in biology, chemistry and physics, who will keep the Faculty of Arts in touch with the views of the Faculty of Medicine in regard to the contents of these courses. An optional subject will be added to the medical students' second year course in Arts, and the passing mark during the two years spent in Arts will be the same as for Arts students.

ONTARIO

The new wing of the Stratford General Hospital is expected to be fully completed by the beginning of March.

It has recently been announced that a bequest of $100,000 was left by the late William H. Hill, of East Toronto, for the purpose of erecting a hospital east of the Don.

Dr. Norman H. Sutton, of Peterborough, has been appointed district officer of health for district number four in place of Dr. George Clinton who has lately been superannuated. Dr. Sutton is a graduate of the University of Toronto and served as medical officer overseas.

We note that the Toronto Branch of the Canadian Association of Massage and Remedial Gymnastics have an office in Pearson Hall, Toronto. Thoroughly trained masseuses and masseurs who can give all forms of treatment in massage and remedial gymnastics may be obtained by applying at that address, or at the Central Registry of Nurses, in Toronto. The association emphasize the fact that no case of massage or remedial gymnastics is undertaken except under medical direction.

The statistical report of the Toronto Board of Health for the year 1922 has the following preface written by Dr. C. J. O. Hastings, the medical officer of health: "In looking over the figures appearing in this annual report of work done it is very necessary to remember that work such as ours does not readily express itself in figures. Take, for example, the attendance of 45,360 babies and children of pre-school age at Child Welfare clinics, shown under 'prenatal, infant and pre-school.' This is an average attendance of thirty-two at each clinic, but the figure itself gives little idea of the work actually done resulting in the improved comfort and health of the babies.

"In addition to the work in the clinics and schools, the public health nurses made 85,394 visits to the homes in connection with their work for babies and young children. In relation to school children, they made 22,531 visits, and to adults, 81,027.

"Psychiatric surveys were made in many schools during the year and intensive mental examinations made of 2,400 children; thirty-five percent of these children were found to be mentally defective.

"The report of the laboratories indicates that ninety per cent. of the milk sold in Toronto had a bacterial count of less than 250,000.

"As far as communicable diseases were concerned, Toronto experienced a light year. Over 50,000 quarantine visits were made to the 9,565 cases reported and 2,500 places were disinfected.

"In the division of Food Inspection a very satisfactory general advancement has been noted throughout the year; 447 whole animals were condemned as unfit for consumption, and 19,885 portions. In addition to the meat, 318,121 pounds of foodstuffs were destroyed.

"Over 4,000 inspections were made of factories and places of amusement by the Division of Housing and Industrial Hygiene, and 68,000 inspections of dwelling places; also over 105,000 inspections concerning nuisances were made by the Division of Sanitation.

"The general volume of business of the Division of Plumbing and Drainage showed an increase of twenty-two percent. over 1921. The inspections increased twenty-six per cent.

"The department's ambulance made 1,952 trips for transportation of communicable disease cases."

BRITISH COLUMBIA

Dr. H. B. Rogers has taken up residence and begun practice at Chemainus, on Vancouver Island.

Dr. W. E. Scott-Moncrieff has returned from California and has recovered from his recent serious operation; welcome back to Victoria.

The B.C. Medical Association has arranged to purchase two, one hundred dollar bonds on behalf of the *Canadian Medical Association Journal*.

A Clinical Meeting of the Association was held in the Vancouver General Hospital on the 16th ultimo when interesting cases of salvarsan jaundice, encephalitis lethargica and carcinoma of the appendix were shown.

A Medical Building for Vancouver on the lines of similar buildings in course of erection in Montreal, Winnipeg, Seattle and elsewhere, was informally discussed for the first time at the meeting of the Association on January 6th. It is hoped that before very long some real progress with such a scheme may be reported.

The Vancouver Medical Association nobly responded to the S.O.S. on behalf of the *Canadian Medical Association Journal* sent out by the Secretary in December last, and at its meeting on January 2nd, decided to purchase two, one hundred dollar bonds.

Anaesthesia formed the topic for discussion at this month's general meeting of Vancouver medical men. Dr. H. W. Riggs opened the subject of the evening with a very interesting paper on local anaesthesia, and was followed by Drs. C. H. Bastin and J. P. Bilodeau who gave their views on general anaesthesia. Dr. R. A. Simpson led the discussion.

The Summer School Committee of the Association is now busy with plans for this year's session, which it is proposed to hold the first week in July, immediately following the meeting of the A.M.A. in San Francisco. It is hoped by holding our Summer School at this particular time, to waylay some of the prominent men from eastern and mid-western cities who will be passing through this city on their way to or from California.

The Victoria Medical Society has been most active since the New Year and the meetings have been largely attended and enjoyed. Dr. Thomas McPherson addressed the January meeting, his subject being "Some Remarks on the uses of Plaster Paris." Dr. G. S. Gordon, of Vancouver, presented a paper on pyelitis at the February meeting. The discussion was carried on by Doctors H. E. Ridewood, J. H. Moore, L. W. Cockburn, T. McPherson, and E. W. Boak.

Dr. John Hunt, of Seattle, Wash., visited Victoria in March and addressed the society on "The Diagnosis and Treatment of Retro-Sternal Goitre." Dr. Hunt's experience rendered the address interesting and instructive. The subject was discussed by Drs. F. M. Bryant, H. E. Ridewood, E. W. Boak, and L. W. Cockburn.

Dr. L. K. Poyntz, who has been Director of the Department of Radiology in the Provincial Royal Jubilee Hospital, Victoria, B.C., during the last five years has resigned this appointment with the intention of taking up residence in Portland, Oregon. He will be associated with Dr. Walker, of that city, and will confine his practice to x-ray diagnosis and treatment and radium therapy. He will also fill an appointment on the teaching staff of the medical faculty of the University of Oregon as lecturer in his specialties. In leaving Victoria, where he has enjoyed the confidence and esteem of the profession and community, Dr. Poyntz carries with him every good wish for his future. The hospital will still continue to have the benefit of this department, which comprises a thorough equipment for x-ray diagnosis and treatment. A deep therapy equipment has been the latest addition; this was the second of its kind to be installed in Canadian hospitals. A large supply of radium is one of the Hospital's valued possessions. Dr. Poyntz was the first Canadian Radiologist to study deep therapy on the continent. The appointment at the Provincial Royal Jubilee Hospital is open at present and the Board of Directors is now receiving applications for the post of Radiologist. Dr. Poyntz has been largely interested in public affairs in Victoria, is a real Rotarian, enthusiastically entering into many activities; he golfs, is a radio enthusiast and has gained some notoriety as a public lecturer and a newspaper contributor. He has taken a very active part in the work of The Victoria Medical Society, is a member of the Executive of the British Columbia Medical Association, and the Canadian Radiological Association, and Honorary member of Victoria Dental Society.

Obituary

Sir Thomas George Roddick. It was with very general regret that the profession throughout Canada learned of the death of Sir Thomas Roddick on February 20th.

To few medical men is it given to be so widely and so generally respected, and to have been able in so many ways to render great service to his country. Born in Newfoundland in 1846, he received his early education in Truro, N.S., and his medical education in McGill University under Campbell, Howard, Sutherland and MacCallum. He graduated with honours in 1868, and afterwards served as house surgeon and later as attending surgeon at the Montreal General Hospital. He was appointed Professor of Clinical Surgery in the Faculty of Medicine, McGill University, in 1875, Professor of Surgery in 1890, and was chosen Dean of the Faculty of Medicine in 1891. On retiring from this position, and from the practice of his profession he was elected as representative of the Faculty on the governing body of the University. As a colleague he was at all times warm hearted and generous; as a teacher he was inspiring. He was beloved by his patients, to whom he was always kind and never exacting.

On the announcement by Sir Joseph Lister of the successful results obtained from the employment of antiseptic lotions and sprays in surgery, thereby checking subsequent inflammation and suppuration, Dr. Roddick was one of the first to recognize the great value of the discovery. He promptly left his work in the hospital and spent three months in Edinburgh, watching Lister's work and learning his methods. On his return he introduced these methods into the surgical wards of the General Hospital, which thereby became one of the first in America to attest the value of Lister's teachings. From here as a centre the great value of antisepsis, and later of asepsis, became generally recognized throughout Canada. When the British Medical Association accepted the invitation of the profession in Canada to hold its annual meeting in Montreal, Dr. Roddick was elected as its President, and was thus the first Colonial President in the history of the British Association. On the outbreak of the North West Rebellion in 1885 he volunteered and was appointed chief surgeon to the Canadian forces. For his services in this expedition he was mentioned in despatches and recommended for the order of C.M.G. Another service rendered to the profession was when he gave up his practice and stood for the St. Antoine division in Montreal as its representative in Parliament, with the object of introducing a bill to establish one possible portal of entrance to the practice of medicine throughout the Dominion. He hoped gradually by means of this common portal to unify the profession in the several provinces and permit those graduating from its examination halls to practise not only in any province of the Dominion, but also in any part of the British Empire. He met with much opposition at first, but gradually overcame it, but not before Parliament was dissolved. He stood again for the same division, and shortly afterwards was able to introduce his bill, now known as the "Roddick Bill," recognized by all the provinces and effecting much good by affording a common standard while effectually protecting the rights of each individual province. To his initiative in 1905 and 1906 the Alexandra Hospital for Infectious Diseases, in Montreal, owes its existence. For many years he acted as its first president, and always took an active part in all matters which affected its interests.

For the past few years Sir Thomas Roddick has been gradually failing in health. An increasing arteriosclerosis compelled him to give up private practice almost entirely, and to absent himself from all public gatherings. His winters were spent in Florida, with the exception of the present one, when his strength did not permit the exertion necessitated by travel. Honoured by the King, by his University, and by his Faculty, and held in affectionate remembrance by his many patients he died very peacefully, and was laid at rest in Mount Royal Cemetery.

Dr. John Franklin Uren one of the senior surgeons of St. Michael's Hospital, Toronto, died on Saturday, March 3rd. Dr. Uren was born in Missouri, Oxford County, in 1863. He was educated at St. Mary's College where he secured a teacher's certificate. After teaching for some years he entered Trinity Medical College graduating in 1890, commencing practice at Acton and later coming to Toronto. For twenty years Dr. Uren was lecturer in clinical surgery at the University of Toronto Medical School; he had been on the staff of St. Michael's Hospital for more than twenty-five years.

Dr. Alexander Ford died at Toronto General Hospital on March 2nd, from septicemia. Dr. Ford was a graduate of Queen's University and practiced in Oshawa for twenty years. He was well known in practice and also held the position of physician to the Grand Trunk Railway.

Dr. Lawrence Bruce Robertson died in the Wellesley Hospital on February 24th. One of the keenest of the younger surgeons and a frequent contributor to the *Journal*, Dr. Robertson will be much missed. Graduating in 1910 from Toronto University he was appointed an interne at the Sick Children's Hospital; leaving it he spent four years on the medical staff of Bellevue and New York Hospitals, and on returning to Toronto, became attached to the Hospital for Sick Children in that city. One of the first volunteers for the "Great War," Dr. Robertson gave splendid service both to the Canadian and Imperial medical corps and it was soon well known throughout the front that transfusion was better done by his method than by that of most of his confrères. Since his return to Canada Dr. Robertson had devoted much time to perfecting the technique of transfusion and his method of exsanguination with subsequent transfusion has been well received in most hospitals. A fuller account of his interesting life and services will appear elsewhere in the *Journal*.

Dr. R. W. Forest died in Toronto on February 23rd in his eighty-fourth year. Born in Lanark, Scotland, he came to Canada early and graduated from the old Toronto School in 1864. In 1864 and 1865 he was engaged in war work with the American army; at the close of the war he settled in Mount Albert where he practiced for the next forty-six years, retiring in 1911 to live in Toronto.

Dr. James Lavell, a prominent Windsor physician and coroner for Essex County, died suddenly in his automobile while driving through Walkerville on March 9th. Dr. Lavell was fifty-seven years of age and had graduated from the Detroit College of Medicine. An active Liberal in politics he had served several terms as a member of the Windsor city council and also as one of its school trustees.

Dr· Alexander McKay, inspector of Provincial Hospitals, died in the Wellesley Hospital, Toronto, on February 18th, aged fifty-three. A graduate of Trinity Medical School in 1895, before he went overseas he had been chief medical inspector of Toronto public schools. On his return from France, he was appointed inspector of hospitals for the Dominion which position he held at the time of his death.

Dr. C. W. Thompson died in Clinton on February 18th in the midst of an active and busy practice. Well known in the district, Dr. Thompson was at work practically to the last day of his life. Dr. Thompson was a graduate of Toronto University in 1893.

Dr. G. W. MacNamara died in Pennsylvania in his seventy-first year. A graduate of Toronto University, Dr. MacNamara had practiced medicine for over thirty years. Two brothers, Dr. A. T., and Dr. J. J., practice medicine in Toronto.

Dr. William T. Greenwood died in St. Catharines on February 25th after a long illness. A graduate of McGill University he had practiced at Niagara-on-the-Lake for some years before settling in St. Catharines.

Book Reviews

The History of Medicine in its Salient Features. By Walter Libby, M.A., Ph.D., University of Pittsburg. 8vo., pp. xii, 427, 9 illustrations. Price, $3.00. Boston and New York, Houghton Mifflin Co. Toronto, Thomas Allen, 1922.

This book is based upon a series of lectures given to a class of third year students in medicine. Pre-Harveian medicine is considered under chapter headings dealing with the Priest-Physicians of Egypt and Babylonia, Hippocrates, Roman Anatomy and Surgery, Arabian Medicine, The Revival in the Sixteenth Century. Following the chapters on Harvey, Sydenham, Boerhaave, and John Hunter, various branches of medical science are treated in detail with a discussion of the influence of various great teachers and writers. Here we find such titles as Morbid Anatomy and Histology with Morgagni and Bichat as the outstanding names, Local Diagnosis with Auenbrugger and Laennec principally considered. Then follow chapters on the advances in Physiology, Embryology (Von Baer) Cellular Pathology, Anaesthetics, Organic Evolution, Bacteriology, Antiseptic Surgery, Syphilis, Tropical Medicine and Medicine in War.

Prof. Libby has made a very readable book, no simple matter when so much which appears important has to be considered in an attempt to cover such an extensive subject particularly when it has to be compressed into relatively few pages. To make mention of all the landmarks in the history of medicine would require most of the space in the book and the result would be much like reading the sixth chapter of the First Book of Chronicles. Some of the more important subjects have been chosen, and about these and the great men concerned there has evolved a story of human interest. The book will not suit everybody for many of the interesting personalities in medicine must perforce be passed over or receive but scant mention—for example, the name of Louis is not to be found. Some may disagree with the author's complete acceptance of the Columbian theory of the origin of syphilis in Europe. The chapter on the theory of organic evolution should perhaps find a place in the history of science rather than in the history of medicine which finds no place for Withering, Beaumont, Bright, Addison, Graves and others who have left an indelible impress upon the science of medicine. In recounting Laennec's story of his first attempt at mediate auscultation the author translates the words "Je pris un cahier de papier" into "I took a paper note book." Forbes translated the words "cahier de papier" as "a quire of paper." If Prof. Libby prefers to consider this as referring to a paper note book how does he translate Laennec's further statement "Le premier instrument dont j'ai fait usage etait un cylindre on rouleau de papier, forme de trois cahiers de papier battu."

There is need for a history of medicine of the type which Prof. Libby has given us and we bespeak for it a large circle of readers. J. H. E.

Bulletin No. VIII of the International Association of Medical Museums and Jounal of Technical Methods. Sir William Osler Memorial number. Part I. Scientific and Practical. Managing Editor, Maude E. Abbott, Montreal, December, 1922, pp. 264. Murray Printing Co., Limited, Toronto.

This well printed and illustrated *Bulletin* is Part I of the Sir William Osler Memorial number. Part II, which is in the press, will present many personal and biographical sketches of him as well as articles on his scientific work and on the way he influenced the work of others.

The present section contains many useful and practical papers which will be read with enjoyment by all who are engaged in or interested in medical museums. Several of these essays are on war museums. One of the most important is entitled "Methods used in the Army Zone for the Preparation of Bone Lesions Resulting from Injuries of War" by L. J. Rhea who devoted much time and ingenuity to this work. Other papers deal with "Colour Preservation and Mounting," "Museum Jars and Labelling," "Photography," "Microscopic Technique," "Bacteriological Technique," and communications on "Comparative and Morbid Anatomy and Pre-Natal Pathology."

The frontispiece is an excellent reproduction of a photograph of William Osler who was a Charter Member of the International Association of Medical Museums. We congratulate the Editorial Board and especially Dr. Maude Abbott upon the excellence of this *Bulletin* and feel sure that their efforts to produce in Parts I and II a fitting Memorial to Sir William Osler will be greatly appreciated by the medical world. A. M.

General and Professional Biology By Edward J. Menge, Ph.D., p. 959, numerous cuts. Price, $6.50. Bruce Publishing Co., Milwaukee, 1922.

This well written and printed book is a veritable mine of information for the student and would prove a valuable addition to the library of any physician. In it he would find a brief but accurate description of such parasites as that of malaria and bilharzia and of the various parasitic worms, and of the mosquito for example. In the first part of the book a survey of the entire field of general biology is given including a history of the science, an introduction to genetics, to palaenotology and to classification. The second part contains an introduction to the embryology of the chick, frog, and mammal, and in the third part the reader is introduced into the study of comparative anatomy. Finally is included sixty-nine pages of glossary, giving the pronunciation and derivation of all the scientific terms used in the book. This is a very valuable feature. If one criticism may be made, it is that the author has perhaps too great a fondness for scientific terms and uses them to excess, but there is no surer method of developing accuracy of thinking than the use of accurate scientific terms. V. E. H.

The Bacteriophage. Its Rôle in Immunity. By F. D'Herelle, translated by George H. Smith, Ph.D. 6x9, 287 pp. Illustrated. Price, $4.25. Williams & Wilkins Co., Baltimore, U.S.A., 1922.

This English edition of the book by D'Herelle, of the Pasteur Institute, is properly a new work containing much new material not found in the French original. It is very simply and well written and excellently translated. The publishers, too, deserve credit for this splendid production. As the whole subject of the book is new, possibly a brief statement may be permitted. The fundamental observation was made in the case of a patient who was suffering from dysentery. Each day a tube of bouillon was inocculated with faecal material. After some hours growth the bouillon was filtered through a Chamberlain filter to remove organisms and some drops of the filtrate added to a fresh culture of the dysentery bacillus and returned to the incubator. While during the course of the disease good growth occurred in the tubes inocculated with dysentery and filtrate, on the day of convalescence no growth occurred and if a few drops of the bouillon were added to a tube turbid with dysentery bacilli, this in a few hours became clear; the bacteria had been dissolved. D'Herelle believes that this clearing was due to the growth of a microorganism ultramicroscopic in size which was a parasite destroying the bacteria. This book sets forth at length, but simply, the reasons for this belief, and also the deductions which may be drawn from the facts ascertained in regard to its rôle in immunity and suggestions as to its practical applications to the treatment of disease. Though the theory has been combatted and is still under discussion, there is little doubt that this discovery is pregnant of further advances in medicine. V. E. H.

A Manual of Diseases of the Nose and Throat—By Cornelius G. Coakley, A.M., M.D., F.A.C.S. Sixth edition, revised and enlarged. Illustrated with 145 engravings and seven coloured plates. Published by Lea & Febiger, New York and Philadelphia, 1922.

This well known book has now appeared in a Sixth Edition. This in itself is sufficient to indicate that it has been found satisfactory. In its present form there has been included all the recent advancements in oto-laryngology of proved value. The technical details of the examination of the nose, pharynx, and larynx, are very clear and well illustrated. A chapter devoted to case taking might advantageously have been added in order to keep before the student and practitioner the importance of viewing the patient's symptoms from the standpoint of a general medical survey. Some of the excellent pages on sinus diseases of children might be curtailed to permit this.

The treatment of disease of the nasal accessory sinuses is very clear and soundly conservative. In fact, treatment throughout the book is very fully and clearly stated. Coakly describes the methods he uses himself and not what everyone else may do.

The illustrations are well chosen and sufficient, particularly those referring to tonsil operations, and post-operative ligature. The final chapter deals with therapeutics and the various remedies are classified so that the reader may understand more clearly the indications for their use.

The book must be classed with the smaller nose and throat works, yet when one considers how much larger works are made up by quotations and references to other writers and the use of many unnecessary illustrations, to describe this book as small, may be misunderstood. It is easy to read, thoroughly sound in its teaching, and one students and general practitioners may readily turn to learn the practice of a sound conservative American rhino-laryngologist. P. G. G

Physics and Chemistry for Nurses, By A. R. Bliss, Jr., A.M., Phm.D., M.D., and A. H. Olive, A.M., Phm.D. Octv. 190 p., 70 illustrations. Price, $2.50. J. B. Lippincott Co., Philadelphia.

This is a simply written book in which the fundamentals of Physics and Chemistry are simply given, and illustrated throughout with simple experiments, which are very pertinent and well chosen. It should be a very useful book to those who have to give such instruction to nurses. V. E. H.

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Books Received

Anaesthesia in Children. By C. Langton Hewer, M.B., B.S., M.R.C.S., L.R.C.P. 111 pages with 31 illustrations. Price, 4s. 6d. net. Published by H. K. Lewis & Co., London.

The Bacteriophage—Its rôle in Immunity. By F. D'Herelle, translated by George H. Smith, Ph.D. 282 pages with 14 text illustrations. Published by Williams & Wilkins, Baltimore, Md., 1922.

Medical Axioms, Aphorisms and Clinical Memoranda. By James A. Lindsay, M.A., M.D., F.R.C.P. 192 pages. Price, 6s. net. Published by H. K. Lewis & Co., Ltd., 28 Gower Place, London, W.C.1.

An Introduction to Electro-Therapy. By Catharine Jameson. 196 pages, with 78 illustrations. Price, 6s. net. Published by H. K. Lewis & Co., 28 Gower Place, London, W.C.1.

Bulletin No. VIII., International Association of Medical Museums and Journal of Technical Methods. Edited by Maude E. Abbott, M.D., McGill University. Montreal, December, 1922. Price, $3.00.

The Successful Physician. By Verlin C. Thomas, M.D. Octavo of 303 pages. Price, $4.00. Published by W. B. Saunders Company, Philadelphia. Canadian Agents, J. F. Hartz Co., Toronto.

Orthopaedic Surgery. By Sir Robert Jones, K.B.E., C.B., and Robert W. Lovett, M.D., F.A.C.S. 681 pages with 712 engravings. Price, $9.00. Published by William Wood & Co., 51 Fifth Avenue, New York.

The Chemistry of Tuberculosis—a compilation and critical review of existing knowledge on the chemistry of the tubercle bacillus and its products, chemical changes and processes in the host, and the chemical aspects of the treatment of tuberculosis. By H. Gideon Wells, M.D., Ph.D.; L. M. DeWitt, M.D.; A. M. and Esmond R. Long, Ph.D. 447 pages. Price, $5.25. Published by Williams & Wilkins Co., Baltimore, 1923.

The Gold Headed Cane. By William Macmichael, M.D. A new edition with introduction and annotations by George C. Peachey. 190 pages, illustrated. Price, $4.50. Published by Henry Kimpton, 263 High Holborn, London, W.C.1., 1923.

American College of Surgeons. Tenth Year Book, 1923. Published at 40 East Erie St., Chicago.

Exercise in Education and Medicine. By R. Tait McKenzie, M.D., LL.D. Third edition, thoroughly revised. 601 pages, with 445 illustrations. Price, $5.00 net. Published by W. B. Saunders Company, Philadelphia. Canadian Agents, J. F. Hartz Co., Toronto.

Optical Methods in Control and Research Laboratories. By J. N. Goldsmith, Ph.D., M.Sc., F.I.C., S. Judd Lewis, D.Sc., B.Sc., F.I.C., Ph.C., and F. Twyman, F.Inst. P. Volume I, second edition. 56 pages, illustrated. Published by Adam Hilger, Ltd., 75A Camden Road, London, N.W.1.

Monographs on Experimental Biology:—

1. THE BIOLOGY OF DEATH. By Raymond Pearl, Johns Hopkins University, being a series of lectures delivered at the Lowell Institute, in Boston, in December, 1920. 268 pages, illustrated. Price, $2.50. Published by J. B. Lippincott Co., 201 Unity Building, Montreal.
2. LABYRINTH AND EQUILIBRIUM. By Samuel Steen Maxwell, M.S., Ph.D. 160 pages, illustrated. Price, $2.50. Published by J. B. Lippincott Co., 201 Unity Building, Montreal.
3. INJURY, RECOVERY, AND DEATH, IN RELATION TO CONDUCTIVITY AND PERMEABILITY. By W. J. V. Osterhout, Ph.D. 252 pages, illustrated. Price, $2.50. Published by J. B. Lippincott, 201 Unity Building, Montreal.

Green's Manual of Pathology and Morbid Anatomy. —revised and enlarged. By W. Cecil Bosanquet, M.A., M.D., F.R.C.P., and G. S. Wilson, M.D., M.R.C.P., D.P.H. Thirteenth edition. 624 pages with 244 illustrations. Price, $6.00. Published by Baillière, Tindall & Cox, 8 Henrietta St., Covent Garden, London, Eng. Canadian Agents, J. F. Hartz Co., Toronto.

Charles White of Manchester, (1728-1813) and The Arrest of Puerperal Fever. By J. George Adami, C.B.E., M.D., F.R.S., containing also a reprint of Charles White's published writings upon puerperal fever. 142 pages. Price, 5s. net. Published by Messrs Hodder & Stoughton, Ltd., London; and The University Press of Liverpool, Ltd.

ONTARIO MEDICAL ASSOCIATION

Forty-Third Annual Meeting

WINDSOR

May 29th, 30th, 31st and June 1st, 1923

The profession of the Border Cities who have this meeting in hand and who have been laying and perfecting their plans since June of last year, are now in a position to announce that all is in readiness for one of the best meetings in the history of the Association.

Preliminary Programmes will be issued shortly. Make your plans now to attend. And remember that a right royal good time awaits you.

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The Canadian Medical Association Journal

Vol. XIII TORONTO, MAY, 1923 No. 5

CANADIAN MEDICAL ASSOCIATION

Annual Meeting, Montreal—June 12th, 13th and 14th, 1923

PRELIMINARY PROGRAMME

HEADQUARTERS

Mount Royal Hotel, Montreal.

HOTEL ACCOMMODATION

Arrangements have been made with the different hotels to secure accommodation for members of the Association at the following terms:

Mount Royal Hotel

Single room with bath....	$3.50 and upwards
" " " shower...	4.00 to 5.00
Double " " bath	6.00 and upwards
" " " shower...	6.00 to 7.00

Ritz-Carlton Hotel

Single room without bath...	$3.50
" " with " ...	5.00 to 7.00
Double " " " ...	8.00 to 10.00

Windsor Hotel

Single room without bath...	$2.50 and upwards
Double " " " ...	4.00
Single " with " ...	3.00 " "
Double " " " ...	5.00 " "

Queen's Hotel

Single room without bath...	$2.50 and upwards
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Double " without " ...	4.00 " "
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Double " without " ...	4.00 " "
Double " with " ...	7.00 " "
Extra person, additional....	2.00 a day

All members are notified to engage rooms from, and to make all arrangements directly with, the Management of the Hotel. All further enquiries as to accommodation may be addressed to the Chairman of the Accommodation Committee—Dr. W. G. Reilly, Drummond Apartments.

TRANSPORTATION

The ordinary Convention Certificate Rates of one fare and a half will be issued to all members of the Association coming from points East of Port Arthur. The date of departure will commence on the 7th June and the tickets will be good for return up till midnight of the 20th June.

To those coming from points West of Port Arthur an extension of time will be afforded. Attention is drawn, however, to the fact that for all members coming from the Far West, it will be more profitable to purchase a "Tourist's Ticket" inasmuch as the rates are cheaper than those issued on the certificate plan.

The Railway Authorities suggest that intending visitors should in any case consult the Local Agent with reference to this alternative.

Railway certificates will be issued in the Registration Room.

REGISTRATION

The registration of members will take place on TUESDAY, the 12th, at 9 o'clock. The registration rooms are in the centre of the Large Hall on the 9th floor, all of which has been reserved for the Association. Members are requested to register promptly.

Montreal members are urged to register on MONDAY, the day before the Meeting, in order to facilitate the work of the Committee.

(N.B.—Railway certificates will be issued in the Registration Room.) (Arrangements for ladies—see below.)

BADGES

Buttons for members, and ribbons for ladies will be issued upon registration.

EXHIBITS

All commercial exhibits will be found on the 9th floor in the Main Registration Hall. This Hall, which is 170 x 50 ft., is lighted on three sides and is undoubtedly the finest Hall of its kind in Canada.

Spaces are available for about fifty exhibits, and nearly all the room has been acquired.

The exhibits will be arranged by the Committee to accommodate the visitors in every way possible.

All exhibitors will be invited to attend a joint meeting with the Executive Committee of the Canadian Medical Association, so that every satisfaction may be afforded to all.

RECEPTION COMMITTEE

Arrangements have been made for the reception of all special guests, and the Committee will make every effort to assist in the entertainment of visitors.

SERVICE BUREAU

This Bureau, which adjoins the meeting rooms, is intended to supply all information relative to the Canadian Medical Association, and is especially for the convenience of new members.

SUGGESTION BOX

For the benefit of this and future meetings a box will be placed in the Registration Room into which members are invited to place any communications relative to the activities of the Association.

ENTERTAINMENTS

Luncheons for members in the Mount Royal Hotel each day at 12.30 o'clock sharp. Tickets for the luncheons will be found in the book of tickets issued on registration. Price, $1.00.

A short address will be given by one of the guests of honour, and routine business will be transacted during each luncheon.

Tuesday Evening at 8.30.

Reception in the Ball Room of the Mount Royal Hotel.

Wednesday, 4.30 p.m.

Garden Party.

7.30 p.m.

Banquet in the Banquet Room of the Mount Royal Hotel. Tickets, $4.00.

Ladies' Banquet in the Salle Dorée. Tickets, $2.00.

Thursday, 1.00 p.m.

Luncheons at the Golf Clubs. LADIES ONLY.

Arrangements will be made for all members who wish to play golf at any of the Clubs in the vicinity of Montreal. Through the kindness of the Committees of the various Golf Clubs, these are open to all who wish to play.

For those who wish to attend the Jockey Club Races, arrangements may be made with any member of the Reception Committee.

ENTERTAINMENTS FOR LADIES

Assembling Rooms and Information Bureau, Mount Royal Hotel—Mezzanine Floor.

A Local Committee of Ladies will be present in these rooms on TUESDAY morning and afternoon from 10.00 to 4.00, and on WEDNESDAY and THURSDAY mornings from 10.00 to 11.00, to receive visiting ladies, arrange for their entertainment and to give any information.

TICKETS FOR ENTERTAINMENTS

All members will receive from the Central Registration Bureau tickets for ladies accompanying them for the following:

1. Tuesday Evening Reception.
2. Afternoon Tea or Garden Party.

Tickets for Special Ladies' Functions will be distributed in the Ladies' Committee Room for:

1. Ladies' Banquet—Wednesday Evening.
2. Golf Club Luncheons—Thursday.

Ladies wishing to play golf will apply at the Ladies' Committee Room.

3. Thursday, 12 noon

By special invitation of the Harbour Commissioners of Montreal, the visiting ladies will be entertained on board the Commissioners' tug *Sir Hugh Allan* for a two hour sail through the Harbour and down river. Buffet luncheon will be served on board.

MOTORS

Motors with the green and white insignia of the Canadian Medical Association on the wind shield, are at the disposal of all visitors.

BUSINESS MEETINGS

The Executive Committee will meet on MONDAY, June 11th, at 10.00 a.m. in the Committee Room on the 9th floor of the Mount Royal Hotel. Subsequently, business will be transacted at the luncheons. The business of the meeting will be concluded immediately after the luncheon on Thursday, at 1.30 p.m. in the general meeting hall.

Tuesday Evening

The Meeting will be opened by the President of the Provincial Association—Dr Grondin.

Address of Welcome—Principal, Sir Arthur Currie.

Addresses by other distinguished visitors including Address by Dr. M. T. MacEachern on "What the Canadian Medical Association stands for."

SCIENTIFIC PROGRAMME

Note—General Sessions will be held in the Auditorium on the Ninth floor of the Mount Royal Hotel.

Rules:

Papers—20 minutes.
Discussion—5 minutes.
Reply—10 minutes.

Tuesday, June 12th.

9.00 a.m.—Registration.

10.30 a.m.—Discussion—Infections of the Hand.

(a) Anatomy. Lantern demonstration.

I. Maclaren Thompson,
Lecturer in Anatomy, McGill University

(b) Treatment. Lantern demonstration.

W. A. Ferguson, Moncton, N.B.

11.10 a.m.—Trauma of the Hand and Forearm.

J. A. Gunn, Winnipeg

11.30 a.m.—Disabilities of the Hand; Frequency and Economic Aspect.

D. D. MacTaggart, Montreal

11.45 a.m.—Industrial Medicine; its Motives and Merits. Lantern illustration.
B. L. Wyatt,
Director, Laurentide Health Service

12.00 noon—Adjournment.

12.30 p.m.—Official Luncheon.

2.00 p.m.—Paper—Septic Factors in the Great Plagues.
W. J. Mayo, Rochester, Minn.

2.30 p.m.—Clinic—Orthopaedic cases: Fracture of Elbow, Malunion of femur and leg, Derangement of knee joint, Potts and Colles fractures, Deformities from Infantile Paralysis, Club foot, Tuberculous joint.
Sir Robert Jones, Liverpool

4.00 p.m.—Paper—Acute Osteomyelitis. Lantern illustration.
Edward Gallie, Toronto

Discussion led by—
Alex. Gibson, Winnipeg;
A. Mackenzie Forbes, Montreal

8.30 p.m.—Reception in the Ball Room.
Chairman—*Dr. S. E. Grondin*,
President, Province of Quebec Medical Association

Address of Welcome,
Principal, *Sir Arthur Currie*,

Addresses by distinguished guests, including Dr. M. T. MacEachern, "What the Canadian Medical Association stands for."

Wednesday June 13th.

9.00 a.m. to 12.00 noon—Sectional clinics in the Hospitals.

12.30 p.m.—Official Luncheon.

2.00 p.m.—Paper—Intestinal Obstruction.
Sir Wm. Taylor, Dublin

Discussion led by—
H. A. Bruce, Toronto;
N. J. McLean, Winnipeg

2.30 p.m.—"Recent Advances in the Treatment of Organic Disease."
Myocarditis and Nephritis.
K. A. MacKenzie, Halifax

Discussion opened by—
L. M. Murray, Toronto
J. A. Oille, Toronto

Pleural Infections.
Duncan Graham, Toronto

Discussed by—
Wm. Boyd, Winnipeg

Insulin and Diabetes. Lantern illustration.
F. G. Banting, Toronto

Discussion opened by
E. H. Mason, Montreal;
I. M. Rabinowitch, Montreal

Paper—The Second Winnipeg Epidemic of Encephalitis.
Wm. Boyd, Winnipeg

7.30 p.m.—Official Banquet. Ball Room.
Ladies' Banquet. Salle Dorée.
Entertainment by Rice Brothers' selected performers.

Thursday, June 14th.

9.00 a.m. to 12.00 noon.—Sectional clinics at the Hospitals.

12.30 p.m.—Official Luncheon.

2.00 p.m.—Symposium—The Problem of More and Better Children.

1. Chairman's Introductory Remarks.
2. Sterility of the Female—Relative and Absolute. Gynaecological Aspect.
   S. E. Grondin, Quebec

   Curettage; its limited indications and multiple contraindications.
   E. St. Jacques, Montreal

   Endocrine Disorders.
   George Hale, London

   Radiation; its use and abuse.
   L. T. Parizeau, Montreal
3. Sterility of the Male.
   F. S. Patch, Montreal
4. Prenatal Care of the Mother.
   Rene de Cotret, Montreal
5. Conservatism in Delivery from the Standpoint of Mother and Child.
   H. M. Little, Montreal
6. Care of the New-Born.
   Hereditary Syphilis.
   E. A. Morgan, Toronto

   The Child's Food.
   Geo. A. Campbell, Ottawa

SECTIONAL and HOSPITAL PROGRAMME

EYE, EAR, NOSE AND THROAT SECTION

Tuesday, June 12th.

2.30 p.m.—Royal Victoria Hospital.
Demonstration of Clinical Cases

7.30 p.m.—Dinner at Mount Royal *Club*.

Wednesday, June 13th.

10.00 a.m.—Mount Royal *Hotel*. Ninth Floor.
Paper: 1. The Diagnostic value of Modern Perimetry in Diseases of the Visual Pathway.
Luther C. Peter, Philadelphia

2. Cerebellar abscess.
J. S. Fraser, Edinburgh

2.30 p.m.—Montreal General Hospital.
Demonstration of Clinical Cases.

Thursday, June 14th.

10.00 a.m.—Hotel Dieu.
Demonstration of Clinical Cases.

2.30 p.m.—Mount Royal Hotel.
Papers:

1. The Correction of Deformities of the Nose by Autogenous Grafts. Lantern illustration.
E. Fulton Risdon, Toronto

2. Suggestions for Refinements in Mastoid Surgery.
Edmund Boyd, Toronto

3. Thrombosis of the Lateral Sinus.
D. H. Ballon, Montreal

4. The Treatment of Tuberculosis of the Eye.
W. G. M. Byers, Montreal

5. The Treatment of Syphilis of the Eye.
F. T. Tooke, Montreal

6. Nasal Drainage in Lachrymal Disorders.
J. A. MacMillan, Montreal

7. The Ocular Malingerer.
A. G. McAuley, Montreal

8. The Slit Lamp and its Application.
J. Rosenbaum, Montreal

9. Some Eye Symptoms in Encephalitis Lethargica.
J. W. Stirling, Montreal

10. The Pathology of the Choroid (Illustrated).
S. Hanford McKee, Montreal

11. Living Case. Intracranial Aircele (Fracture of frontal bone) complicated by Wernicke Aphasia. (Sensorial).
J. P. E. Bousquet, Montreal

12. Serous Meningitis with report of case.
E. Hamilton White, Montreal

Joint Secretaries

J. P. E. Bousquet and *S. Hanford McKee*

Programme communications should be sent to
S. Hanford McKee, 158 Crescent Street, Montreal

CANADIAN SOCIETY OF ANAESTHETISTS

Third Annual Meeting

Headquarters and Sessions, Mount Royal Hotel, Mezzanine Floor

Tuesday Forenoon, June 12th.

Registration—Mount Royal Hotel.
Demonstrations—Biological Building, McGill University.

Department of Botany—Influence of Anaesthesia on Plant Growth.
Professor F. E. Lloyd

Department of Pharmacology—Demonstrations by *Professor H. J. Barbour*, *Professor R. L. Stehle* and *Wesley Bourne.*

Tuesday Afternoon, June 12th.

Mount Royal Hotel, Mezzanine Floor

2.00 p.m.—Presentation of Gavel—*Col. Wm. Webster*, Winnipeg.

Address of Welcome—*W. W. Chipman*, Professor of Gynaecology and Obstetrics, McGill University.

Minutes of Previous Meeting.
Treasurer's Report.
Election of New Members.
Election of Officers for 1923-4.
Following nominations already made:

Walter L. Muir, Halifax, N.S.—*President.*
J. J. Buettner, Syracuse, N.Y.—*Vice-President.*
F. H. McMechan, Avon Lake, Ohio *Executive Officer for U.S.A.*
H. E. G. Boyle, London Eng. *Executive Officer for Great Britain.*
H. J. Shields, Toronto—*Secretary-Treasurer.*

Executive Committee:

Ernest B. Convery—Quebec, P.Q.
David D. Freeze—Vancouver, B.C.
J. E. Racicot—Montreal.
George C. Van Wart—Fredericton, N.B.

President's Address:
David H. Arnott, London, Ont.

The Effects of Ether Anaesthesia on Afferent Paths in Decerebrate Animals.
Alexander Forbes and *R. H. Miller*,
Department of Physiology, Harvard Medical School.

The Influence of Pain and its Allies upon the Cells of the Cerebral Cortex.
G. S. Foster, Manchester, N.H.

Certain Experimental and Clinical Observations in Ether Anaesthesia.
T. K. Kruse,

Department of Pharmacology, University of Pittsburg.

Blood Effects after Ether Anaesthesia and Transfusion.
E. C. Levine, Montreal

Shock Prophylaxis.
C. J. Wells, Syracuse, N.Y.

Tuesday Evening, June 12th.

Annual Dinner at the Mount Royal Hotel.

Wednesday Forenoon, June 13th.

Anaesthesia Clinics at the Following Hospitals:
Hotel Dieu.
Montreal General.
Notre Dame.
Royal Victoria.
Montreal Maternity.
Montreal Western.

Arranged by the Anaesthetists of the various Institutions and for which Bulletins will be issued on the previous day.

Wednesday Afternoon, June 13th.

2.00 p.m.—Mount Royal Hotel, Mezzanine Floor.

On the Impurities occurring in Anaesthetic Ether.
Professor Allan W. Rowe, Boston

Further Studies on the Pharmacological effects of Impurities in Anaesthetic Ether.
Professor W. L. Mendenhall, Boston

A Case of Fatty Degeneration of the Liver following Ether Anaesthesia.
W. B. Howell, Montreal

Postoperative Pulmonary Complications.
W. Pickles and *C. O. Cooke*, Providence, R.I.

Psychology, its relation to the Anaesthetist.
J. J. Buettner, Syracuse, N.Y.

Gas-Oxygen, the theory *versus* the practice.
W. Easson Brown, Toronto

Wednesday Evening, June 13th.

Banquet jointly with the Canadian Medical Association.

Thursday Forenoon, June 14th.

Anaesthesia Clinics at the various Hospitals as on Wednesday Forenoon.

Thursday Afternoon, June 14th.

2.00 p.m.—Mount Royal Hotel.

Observations on some Reflex Effects of Ether Anaesthesia.
Professor M. S. Dooley, Syracuse, N.Y.

Reflex Rigidity under Anaesthesia.
A. E. Guedel and *Karl Ruddell*, Indianapolis

Preliminary Medication.
Robert Hammond, New York

New Trends in Anaesthesia.
F. H. McMeehan, Avon Lake, Ohio

The Anaesthesia Problem in Exophthalmic Goitre.
Don A. Warren, Hamilton, Ont.

Preoperative Digitalization.
Everett Tyler, Philadelphia

Office of the Secretary, 34 St. Mark Street, Montreal.

THE CANADIAN RADIOLOGICAL SOCIETY

Fourth Annual Convention in conjunction with the

Canadian Medical Association, Montreal, June 12th, 13th, 14th, 1923

Mount Royal Hotel, -- Mezzanine of Ninth Floor.

PRELIMINARY PROGRAMME

To date, the following papers have been promised:

Dr. W. H. Dixon, Toronto—Subject: gastro intestinal.

Dr. G. E. Richards, Toronto—"Deep therapy in Cancer."

Dr. Tovell, Toronto—"Primary Lung Growths."

Dr. H. H. McIntosh, Vancouver—(Title later).

Dr. A. W. George, Boston—(Title later).

Dr. Chas. G. Sutherland, Mayo clinic, Rochester—(A Study of 7,000 roentgenologic examinations of the stomach).

Dr. A. E. Walkey—"Multiple Myeloma."

Dr. W. H. McGriffen—"Carcinoma of the Colon."

Dr. Walter Wilkins, Montreal—"Superficial X-ray Therapy."

Dr. Cheney, Montreal—"Measurement of X-ray in deep therapy and superficial therapy."

Dr. Leo Pariseau, Montreal—"Physics of Deep X-ray therapy and of Radium."

Dr. Howard Pirie, Montreal—"Failures in deep therapy and contraindications for its use."

Dr. Brooks, Montreal—"Success in deep X-ray therapy."

SCIENTIFIC EXHIBITS

A large dark room has been set aside for the display of plates, slides, apparatus. All those wishing to exhibit will please communicate with Dr. H. Pirie, Royal Victoria Hospital (Montreal), so that he may provide the necessary viewing-boxes and tables.

THE RADIUM INSTITUTE

Arrangements are being made for a special visit to the new Radium Institute endowed by the provincial government and installed at the University of Montreal. *One gram* of Radium is available for the production of emanation and an additional quarter gram for research work and special cases.

The apparatus for the production of emanation is probably the most elaborate in America.

X-RAY CLINICS IN HOSPITALS

The principal hospitals of the city are wide open all week. Every one of the local radiologists has promised to collect such cases as will demonstrate completely some particular technique.

COMMERCIAL EXHIBITS

Manufacturers of X-ray and electromedical apparatus have secured space in the exhibition hall of the Canadian Medical Association Convention. The latest types of instruments and accessories will be on view.

ACCOMMODATION, ETC.

For particulars on transportation, hotels and registration, please consult the programme of the Canadian Medical Association. Official correspondence should be addressed to the President of the Society, Dr. L. J. Carter, Brandon, Manitoba. Any information needed will be gladly furnished by the Chairman of the local committee:

Dr. Leo E. Pariseau, X-Ray Department,
Hotel Dieu, Montreal.

HOSPITAL CLINICAL WEEK, JUNE 11th to JUNE 16th

NOTRE DAME HOSPITAL

Monday, June 11th.

Theatre No. 1

9.30 a.m.—Drs. Ethier and R. Trudeau—Gynaecology, Operative clinic.

9.30 a.m. to 12 noon:
Medical wards.
Drs. E. P. Benoit and A. Lesage—Bedside clinics and demonstrations.

Surgical wards.
Drs. O. F. Mercier, T. Parizeau and B. G. Bourgeois—Bedside clinics and demonstrations.

10.00 a.m. to 11.00 a.m.:
Dermatology and Syphilography.
Drs. G. Archambault, J. E. Toupin, A. Marin and R. Dore—Clinics and demonstrations.

Wednesday, June 13th.

Theatre No. 3

9.30 a.m.—Dr. E. P. Benoit—Blood pressure, normal and pathological physiology.

10.15 a.m.—Dr. J. A. Rouleau—Syphilis of the brain with pathological specimens.

11.00 a.m.—Dr. G. Archambault—Arsenic and bismuth therapy in the treatment of syphilis.

Theatre No. 1

9.30 a.m.—Dr. O. F. Mercier—Treatment of Fractures.

10.30 a.m.—Dr. A. Ethier—Ectopic pregnancy.

11.15 a.m.—Dr. A. Prevost—Radio-therapy in the treatment of cerebral tumours.

Theatre No. 4

9.30 a.m.—Drs. E. Dufresne, L. Blagdon and J. U. Gariepy—Demonstration of apparatus in fractures.

Medical wards.

9.30 a.m. to 12 noon—Drs. E. P. Benoit and A. Lesage—Bedside clinics and demonstrations on patients.

Department of Dermatology and Syphilography (in charge of Dr. G. Archambault).

9.30 a.m.—Dr. A. Marin—Technique of blood drawing on the adult and the nursling.

10.00 a.m.—Dr. R. Dore—Technique of lumbar puncture.

10.30 a.m.—Dr. J. R. Toupin—Technique of intravenous and intra-muscular injections (Salvarsan, neo-Salvarsan, sulfarsenol, eparseno, cyanide of mercury, etc.)

10.30 a.m.—Dr. W. Derome—Ultra-microscope and Wassermann (technique and demonstrations).

Outdoor Surgical Department.

10.00 a.m. to 12 noon—Drs. Ferron and Bellerose—Demonstrations.

Thursday, June 14th.

Theatre No. 3

9.30 a.m.—Dr. A. Lesage—Modern views on dyspepsia (prognosis and treatment).

10.30 a.m.—Dr. T. Parizeau—Treatment of ulcer and cancer of the stomach.

11.15 a.m.—Dr. A. Leger—Clinical interpretation of Ambard's test.

Theatre No. 1

9.30 a.m.—Dr. B. G. Bourgeois—Duty of the practitioner in the treatment of urological patients.

10.15 a.m.—Dr. W. Derome—Ambard's test in the appreciation of the renal function.

11.00 a.m.—Dr. N. Fournier—Treatment of different kinds of urethritis.

Theatre No. 4

9.30 a.m. to 12 noon—Drs. O. A. Demers and O. A. Gagnon—Demonstrations of treatment and apparatus in articular lesions (Pott's disease, osteo-arthritis).

Laboratory of Radio-and Radiumtherapy.

10.00 a.m.—Dr. J. E. Panneton—Indications and contra-indications of roentgen and radiumtherapy in uterine fibroids and haemorrhages.

Surgical wards.

10.00 a.m. to 12 noon—Drs. O. F. Mercier and T. Parizeau—Bedside clinics and presentation of patients.

Dispensary of Venereal Diseases.

10.00 a.m. to 12 noon—Dr. N. Fournier—Modern technique in venereology.

Friday, June 15th.

Theatres No. 1 and 2

9.30 a.m. to 12 noon—Surgical and gynaecological operations.

Dispensary of Dermatology.

9.30 a.m.—Presentation of patients.

11.00 a.m.—Dr. G. Archambault—Treatment of primary syphilis.

10.00 a.m. to 12 noon—Bedside clinics and presentation of patients—(Drs. Mercier, Benoit, Parizeau, Lesage, Ethier, Aubry, Demers and Gagnon).

Saturday, June 16th.

Theatres No. 1 and 2

9.30 a.m. to 12 noon—Surgical and gynaecological operations.

Dispensary of venereal diseases.

10.00 a.m. to 12 noon—Presentation of patients and demonstrations.

10.00 a.m. to 12 noon—Bedside clinics and presentation of patients—(Drs. Bourgeois, Trudeau, Rouleau, Leger, Dufresne, Blagdon and Gariepy).

ST. PAUL HOSPITAL

(Contagious Diseases)

Wednesday, June 13th.

9.00 a.m. to 11.00 a.m.—Bedside clinics and presentation of patients.

Dr. J. A. Leduc—Treatment of diphtheria (Serums, Schick's test, toxine-anti-toxine therapy).

Thursday, June 14th.

10.00 a.m. to 11.00 a.m.—Bedside clinics and presentation of patients.

11.00 a.m.—Dr. P. Del Vecchio—Treatment of scarlet fever.

ROYAL VICTORIA HOSPITAL

Wednesday, June 13th.

Medicine

9.00 a.m. to 10.00 a.m.—Dr. W. F. Hamilton—Theatre clinic.

10.00 a.m. to 10.45 a.m.—Dr. A. Henderson—Demonstration of protein sensitization tests.

10.45 a.m. to 11.15 a.m.:

Dr. J. Kaufmann—1. Subcutaneous administration of oxygen in measured doses. Demonstration of apparatus.

2. A new diuretic for intramuscular administration.

11.15 a.m. to 12 noon—Dr. C. Russell—The treatment of neuro-syphilis with demonstration of lumbar puncture.

Surgery

9.00 a.m. to 10.30 a.m.—Dr. G. E. Armstrong—Theatre lecture on rotation of the colon, with lantern slides.

10.30 a.m. to 11.30 a.m.—Dr. C. B. Keenan—The plating of compound fractures.

11.30 a.m. to 12 noon—Dr. E. Levine—Demonstration of blood transfusion.

Genito-Urinary Surgery

9.00 a.m. to 10.30 a.m.:

Dr. D. Mackenzie—Theatre clinic on.

1. Kidney infections; diagnosis and treatment.
2. Prostatism; diagnosis and treatment.

Orthopaedic Surgery

10.30 a.m. to 12 noon:

Dr. W. G. Turner—1. Treatment of congenital dislocation of the hip. Results.

2. The tubercular knee. Results.

Thursday, June 14th.

Medicine—Theatre clinics

9.00 a.m. to 10.00 a.m.—Dr. E. H. Mason—The modern treatment of diabetes, including the effect of insulin on metabolism.

10.00 a.m. to 11.00 a.m.—Dr. D. S. Lewis—Treatment of nephritis.

11.00 a.m. to 12 noon—Dr. C. F. Moffatt—The treatment of cardiac failure.

Surgery

9.00 a.m. to 10.00 a.m.—Dr. E. W. Archibald—Theatre clinic on the results of extensive rib resection in the treatment of pulmonary tuberculosis.

10.30 a.m. to 12 noon—Dr. A. E. Garrow—The operative treatment of coloptosis.

Gynaecology

9.00 a.m. to 12 noon—Dr. W. W. Chipman—Theatre clinic on prolapsus uteri. The radical cure of the hernia, with case for operation.

In addition to the above Canadian Medical Association programme, on Monday, Friday, and Saturday the staffs of the various departments at the Royal Victoria Hospital will be at home to members who desire to follow their rounds. In particular the following clinics have been arranged.

Monday, June 11th.

In Medicine, Dr. W. F. Hamilton will give a ward round from 9.00 a.m. to 10.00 a.m.

In Gynaecology, Dr. H. C. Burgess will give a theatre clinic abortion on from 9.00 a.m. to 10.00 a.m.

In Surgery, Dr. G. E. Armstrong will give a theatre clinic from 10.00 a.m. to 11.00 a.m. Dr. Keenan will give ward rounds from 9.00 a.m. to 10.00 a.m., and Dr. Archibald will give ward rounds from 11.00 a.m. to 12 noon.

In Genito-urinary surgery, Dr. Mackenzie will give a ward round from 9.00 a.m. to 10.00 a.m.

Friday, June 15th.

In Gynaecology, Dr. J. R. Fraser will give a theatre clinic on the treatment of pelvic infections from 9.00 a.m. to 10.00 a.m.

In Medicine, Dr. C. F. Martin will give a theatre clinic from 10.00 a.m. to 11.00 a.m. Dr. Hardisty will give a theatre demonstration in the use of the duodenal tube for bile drainage, from 11.00 a.m. to 12 noon.

In Genito-urinary surgery, Dr. Mackenzie will give a ward round from 10.00 am. to 11.00 a.m.

In Surgery, Dr. Scrimger and Dr. McKenty will give ward rounds from 10.00 a.m. to 12 noon.

Saturday, June 16th.

In Gynaecology, Dr. W. W. Chipman will give a theatre demonstration from 10.00 a.m. to 12 noon.

In Surgery, Dr. Keenan will give a ward round from 9.00 a.m. to 10.00 a.m., and Dr. Archibald will give a ward round from 11.00 a.m. to 12 noon.

Dr. Burnett will give a dermatological clinic from 10.30 a.m. to 12 noon.

In addition to the above there will be given during the forenoon throughout the week, continuous demonstrations in the following departments:

I.—X-ray Department.
  1. The massive use of x-rays in cancer therapy.
  (*Dr. Pirie* and *Dr. Brooks*).
  2. Exhibits of skiagrams.
  (*Dr. Pirie* and *Dr. Cheney*).

II.—Demonstration of the art of medical illustration.
  (*Miss Lawson*).

III.—Demonstration of electrocardiograms.
  (*Dr. Moffat*).

IV.—Department of Metabolism.
  1. Demonstration of routine metabolism work.
  (*Dr. Walker*).

V.—Department of Pathology.
  1. Demonstration of interesting pathological specimens.

VI.—Department of hydrotherapy.
  The uses of mechanotherapy and hydrotherapy.
  (*Dr. Brown* and *Miss Ross*).

MONTREAL MATERNITY HOSPITAL

Wednesday, June 13th.

9.00 a.m.—Dr. W. A. G. Bauld—Technique of Normal Delivery.
9.45 a.m.—Dr. H. C. Burgess—Application of Forceps.
10.30 a.m.—Dr. J. W. Duncan—Induction of Labour.
11.00 a.m.—Dr. H. M. Little—Version and Extraction.

Thursday, June 14th.

9.00 a.m.—Prenatal examination. Methods used. Demonstration-living cases-contracted pelves. Toxaemia, etc.
Dr. J. R. Fraser

10.00 a.m.—Puerpal Infection—Newer methods of Treatment.
Dr. J. R. Goodall

11.00 a.m.—Caesarean Section.
Dr. W. W. Chipman

During the week, June 11th to 16th, rounds will be made daily at 10.00 a.m., and to this will be added case room work as it presents itself.

Dr. Wesley Bourne, Anaesthetist to the Hospital, will demonstrate at the clinics, special methods (Gas and Oxygen) in Anaesthesia.

SAINT JUSTINE HOSPITAL FOR CHILDREN

Wednesday, June 13th.

MEDICAL DEPARTMENT:

1.—Achondroplasia. Presentation of a case.
Dr. R. Masson

2.—Proteintherapy in milk anaphylaxis.
Dr. Lafleur

3.—Syphilis of the new-born.
Dr. Decarie

4.—Early diagnosis of tuberculosis in children.
Dr. Desrochers

5.—Inspection of the hospital.

Thursday, June 14th.

1.—Social aid to childhood in the Province of Quebec.
Dr. Lapierre

2.—Dietary of the eczematous child.
Dr. Decarie

3.—Subcutaneous abscesses of the new-born.
Dr. Bourgoin

4.—Dietary of the bottle fed babies.
Dr. Dutilly

5.—Hospitalization of the poor.
Dr. Bernard

Wednesday, June 13th.

SURGICAL DEPARTMENT:

1.—Hare Lip. (Cleft palate; approximating the maxillae, Dr. Ferron's personal method).
Dr. Ferron

2.—Deformity of the Tibia (Rickets). (Osteotomy of the tibia and immobilization in plaster of Paris casing).
Dr. Crépault

3.—Spina Bifida. (Excision of the tumour and isolation of the nerve cords).
Dr. Dubé

4.—Hare Lip. (Restoration of the lip and nostril.
Dr. Ferron

5.—Torticollis. (Tenotomy and immobilization in plaster of Paris casing).
Dr. Rivard

Thursday, June 14th.

1.—Hypospadias (Formation of a new urethra).
Dr. Ferron

2.—Prolapse of the Rectum (Metallic ring).
Dr. Crépault

3.—Hare Lip (Cleft palate; approximating the maxillae. Dr. Ferron's personal method).
Dr. Ferron

4.—Retained Testis (Orchidopexy).
Dr. Dubé

5.—Scoliosis (Plaster corset).
Dr. Rivard

Friday, June 15th.

1.—Hare Lip. (Restoration of the lip and nostril).
Dr. Ferron

2.—Retained Testis (Orchidopexy).
Dr. Crépault

3.—Hypospadias (Formation of a new urethra; second step).
Dr. Dubé

4.—Deformity of the Femur. (Rickets). (MacEwen's supracondyloid osteotomy).
Dr. Ferron

5.—Pott's Disease (Plaster corset).
Dr. Rivard

CHILDREN'S MEMORIAL HOSPITAL

Clinics and Demonstrations will be provided for Monday, Wednesday and Thursday.
Details to be announced in Final Programme.

MONTREAL GENERAL HOSPITAL

Monday, June 11th.

Medicine

10.00 a.m. to 12.00—Ward Rounds.
C. A. Peters
A. H. Gordon

9.30 a.m. to 12.00—Metabolic Laboratory.
I. M. Rabinowitch

11.00 a.m. to 1.00 p.m. Outdoor Clinic.
A. A. Robertson

11.00 a.m. to 12.30—Dermatological Clinic.
G. G. Campbell

Surgery

9.30 a.m. to 12.00—Operative clinics
Drs. Hutchison, Barlow, Tees and *Johnson*

11.00 a.m. to 1.00 p.m. Outdoor clinic.
F. B. Gurd

1.00 p.m. Operative clinics.
Drs. Bazin, Eberts, Henry, Pennoyer and *Gurd*

Wednesday, June 13th.

Medicine

9.30 a.m. Pediatrics—Selected cases.
A. B. Chandler

10.00 a.m. Medical clinic.
F. G. Finley
H. A. Lafleur

10.30 a.m. Myxoedema with Pericardial Effusion.
C. A. Peters

11.00 a.m. Dermatology—Selected cases—Lantern Demonstration.
G. G. Campbell

11.30 a.m. Diabetes.
I. M. Rabinowitch

Surgery

9.00 a.m. (a) Drainage of the abdomen, Indications and Contra-indications, Methods and Material.
A. T. Bazin

Discussed by W. J. Mayo and others.

(b) Direct Inguinal Hernia—Plastic Repair—End results.
A. T. Bazin

10.00 a.m. Urology
F. S. Patch

10.30 a.m. Orthopaedics — Claw Foot — Operative Treatment
J. A. Nutter

11.00 a.m. Gynaecology—Hysterectomy.
F. A. Lockhart

Thursday, June 14th.

Medicine

9.30 a.m. Clinic—Pathological Conference.
L. J. Rhea and Clinicians

10.30 a.m. Acute Yellow Atrophy of Liver.
A. H. Gordon

11.00 a.m. Encephalitis lethargica.
F. H. Mackay

11.30 a.m. Heart Studies. Electrocardiagram.
C. C. Birchard

Surgery

9.30 a.m. Thyroidectomy.
E. M. Eberts

10.00 a.m. Pancreatitis.
W. L. Barlow

10.30 a.m. Estlander operation.
J. Alex. Hutchison
Chronic Empyema.
F. B. Gurd

11.00 a.m. Chronic Pelvic Disease.
H. M. Little

11.30 a.m. Rheumatoid Arthritis.
A. Mackenzie Forbes

Friday, June 15th.

Medicine

10.00 a.m. to 12.00 Ward Rounds
C. A. Peters
A. H. Gordon

10.30 a.m. to 12.00—Medical Outdoor clinic
C. F. Wylde

9.30 a.m. to 12.00—Metabolic Laboratory Methods.
I. M. Rabinowitch

Surgery

9.30 a.m. to 12.00—Operative Clinics.
Drs. Bazin, Eberts, Pennoyer, Henry and *Gurd.*

11.00 a.m. to 1.00 p.m. Surgical Outdoor Clinic.
W. L. Barlow

1.00 p.m. Operative Clinics.
Drs. Hutchison, Barlow, Tees and *Johnson*

Saturday, June 16th.

Medicine

10.00 a.m. to 12.00—Ward Rounds.
C. A. Peters
A. H. Gordon

10.30 a.m. to 12.00—Medical Outdoor Clinic.
J. Geo. Browne

11.00 a.m. to 12.00—Dermatology—Outdoor Clinic.
G. G. Campbell

Surgery

11.00 a.m. to 1.00 p.m. Surgical Outdoor Clinic.
C. K. P. Henry

10.00 a.m. to 12.00—Fractures—Follow up Clinic.
F. J. Tees
F. B. Gurd

HOTEL DIEU

Wednesday, June 13th.

9.00 a.m. to 12.00—Clinical Symposium on the Endocrine Glands.

Thursday, June 14th.

9.00 a.m. to 12.00—Clinical Demonstrations in the wards and Theatres.
(According to cases available)
Details will be announced in the Daily Bulletins.

ALEXANDRA HOSPITAL

(Contagious Diseases)

Ward Rounds and Demonstrations daily throughout the week—except Tuesday.

MENTAL DISEASES

Arrangements have been made with St. Jean de Dieu Hospital (Longue Pointe) and the Protestant Hospital for the Insane (Verdun) for a series of Demonstrations and clinics. Details will be announced in the Final Programme.

TUBERCULOSIS

The Bruchesi Institute and the Royal Edward Institute will demonstrate the diagnosis and management of Tuberculosis in an Outdoor Clinic.

Relative Value of Surgery and Roentgen Ray in the Treatment of Hyperthyroidism.—Edward P. Richardson, Boston, states that a comparison of the cases treated by roentgen ray and those treated by thyroidectomy shows that the average results in all cases treated by subtotal thyroidectomy are better than the results in a selected two-thirds of the cases treated by roentgen ray. The metabolism shows a drop to about +10, as compared with +20 for the roentgen ray cases; the pulse, a drop to 80, as compared with 90; the weight, a tendency to more persistent and greater increase. The rate of fall in metabolism and pulse is about equal. The reason for this is that in certain of the patients who underwent ligation of both superior thyroid arteries, followed by thyroidectomy in two stages, the whole of the surgical treatment required four months, and in one case eight months for completion. In nine cases treated by immediate subtotal thyroidectomy in one stage the sharp fall in metabolism and pulse and gain in weight are striking. Richardson says there can be no doubt that the average results in surgery are better than those following roentgen ray treatment. The roentgen ray has a beneficial effect in certain cases of hyperthyroidism, but this effect is not sufficiently constant to be relied on as the sole form of treatment. In selected cases of exophthalmic goitre, the use of roentgen ray treatment under careful control is justifiable for a period of four months, during which the patient receives about five treatments. If, after four months of treatment, the degree of improvement obtained in general condition and basal metabolic rate does not promise "cure," operation should be undertaken.—*Jour. Am. Med. Assoc.*, March 24, 1923.

Clinical Experience With Kolmer Complement Fixation Test for Syphilis.—The Kolmer complement fixation test Jay Frank Schamberg and S. S. Greenbaum, Philadelphia, state is distinctly more sensitive than the routine three antigen method. With its employment, the serums of syphilitic subjects are slower in becoming negative, thus insuring more adequate treatment. The test detects relapsing positives at an earlier period than the older method. The quantitative character of the test enables the physician to determine more accurately the serologic status of the patient, and to gauge the influence of treatment. The authors have never observed a false positive reaction by the Kolmer test. They regard the Kolmer test as an invaluable advance in the serologic study of syphilis.—*Jour. Am. Med. Assoc.*, March 24, 1923.

SURGICAL POSSIBILITIES IN TRAUMATIC RUPTURE OF THE INTESTINE*

A. L. Lockwood, M.D., C.M., F.A.C.S.

Lockwood Clinic, Toronto

In considering the surgical possibilities of intestinal injury, the effect of involvement of other hollow and solid viscera within the abdomen must be clearly borne in mind. Although up till 1915 some doubt apparently existed as to the necessity for operation in intestinal injury and opinions differed as to the nature of the operation when undertaken, the last three and one-half years of war surely determined beyond doubt the routine procedure necessary to save life in undoubted perforations and lacerations of the intestine. There are, however, certain intra-abdominal emergencies caused by external violence without penetration of the abdomen, the diagnosis of which is always difficult and often impossible. The scope of this subject is so vast that I will confine myself to a *resumé* of the surgical possibilities of these cases, having clearly in mind the fact that other grave injuries are frequently associated with the involvement of the intestine. What the surgeon must determine is whether he is dealing with a trivial injury for the relief of which an operation is entirely unnecessary, or whether he is confronted with a grave calamity demanding immediate surgical interference.

Etiology.—Rupture of the intestine is caused: (1) By direct crushing compression; (2) by tearing, due to sudden oscillation; (3) by bursting of the intestine.

The injury may be due to: (1) A sharp blow on the abdomen by a large object, as a horse's hoof; (2) a sharp blow on the abdomen from a small object, travelling at a high speed; (3) direct compression by being crushed or running against a sharp object; (4) an indirect force such as falling on the feet or buttocks, or a blow on the back or loin; (5) increased air pressure within the intestine, the so-called pneumatic ruptures, of which twenty-six cases have been reported, caused by compressed air being forced suddenly into the rectum.

Direct compression of the intestine against the vertebral column, the promontory of the sacrum or the crest of the pelvis is the commonest cause. A small percentage of ruptures are due to sudden oscillation. Rupture due to this cause results in a tear usually at the fixed portion of the gut, generally at the duo-jejunal flexure, occasionally at the ileo-caecal junction. Rupture occurs more easily in a relaxed abdomen with distended intestine and is facilitated by adhesions, disease of the intestinal wall and hernia.

The extent and site of the lesions.—Rupture may be complete or incomplete, and the symptoms thus be immediate or delayed. Most ruptures involve all the coats of the intestine but partial rupture is not uncommon. Whether it is the mucous or submucous coat or the peritoneal coat that is most often involved in partial rupture is a question, I believe, of the nature of the force applied. Certainly melæna is rarely observed in such cases, which would lead one to doubt if the mucous and submucous coats are often torn without involvement of the peritoneal coat. Usually it would seem that it is the peritoneal coat that first gives way and later the submucous and mucous coats. Hertle fairly well confirmed this experimentally. Gangrene and late spontaneous rupture of gut cut off from its blood supply by thrombosis of the mesenteric vessels is not uncommon. Complete severance of the small intestine is usual. Laceration due to tearing occurs at the fixed portion of the small intestine. Partial rupture of the circumference of the large bowel is most commonly found. Lesions of the duodenum and colon are very often retro-peritoneal.

I have collected six hundred and fifty-two cases of traumatic rupture of the intestine occurring in civil life, reported by various authors. Many such cases were reported during the war but are not included. Of the six hundred and fifty-two cases, approximately one in ten involved the large bowel and the rest the small bowel. Allowance must necessarily be made for some unavoidable over-lapping in reported statistics. Of injury to the large bowel, the caecum, transverse colon, and pelvic colon are involved in that order. The jejunum and ileum appear to be injured in equal proportions, and about three times as often as the duodenum. It would seem logical, however, that the ileum should be the most common site of rupture and such would probably be borne out if the exact site of rupture had been stated in all cases.

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*Read at combined meeting of Sections of Medicine and Surgery, Academy of Medicine, Toronto, Nov. 21st 1922.

With external bruising above the umbilicus, the first few feet of the jejunum are usually involved, whereas, when the bruising is below the umbilicus the ileum, as a rule, is involved.

TABLE I

SITE OF RUPTURE

	Curtis 1887	Makins 1899	Chavasse	Gage 1902	DaCosta 1903	Hertle 1907	Berry and Gusseppi 1908	Zeidler's Clinic 1912	Cope and Johnson 1914	Moynihan 1915	Battle, 1919 (collected to 1919)	Andrews, Bendixen and Blything	Buckbinder (pneumatic rupture)	Variousauthors	
Large Intestine	7	5	19	11	..	11	10	3	2	..	11	26	..	..	10.3%
Caecum	..	1	..	..	..	2	2	..	..	..	..	..	..	..	..
Ascending Colon	..	1	..	..	..	2	..	..	..	..	..	..	..	..	..
Hepatic Flexure	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Transverse Colon	..	2	..	..	..	2	3	..	..	..	..	..	..	..	..
Splenic Flexure	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
Descending Colon	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Sigmoid Flexure	..	1	..	..	..	3	4	..	..	..	..	..	..	..	..
Rectum	..	..	..	..	..	1	..	..	..	..	..	..	..	2	..
"Small Intestine" (not otherwise stated)	103	16	..	2	2	31	25	..	43	2	2	..	..	5	89.7%
Duodenum	6	7	..	10	..	12	28	1	5	..	32	..	..	..	..
Duodeno-Jejunal Flexure	..	..	..	..	..	..	3	..	..	1	..	..	..	..	..
Jejunum	..	..	106	20	1	29	32	48	23	..	111	..	..	3	..
Ileum	..	..	..	42	1	40	32		13	..	59	..	..	4	..
Large and Small Intestine	..	..	7	..	..	..	4	..	..	..	..	..	..	..	..
Not Stated	..	..	..	..	31	..	..	..	..	14	..	..	..	..	..

Symptoms of intestinal rupture.—The symptomatology of intestinal rupture varies with the nature of the injury, the association of other injuries, the location and extent of the lesions of the intestine, the general resistance of the patient, the state of the intestine when injured, whether full or empty, the interval and activity of the patient following the injury, and the treatment from the time of the accident till examined, whether or not fluids have been given by mouth or rectum, and whether or not morphine has been administered. Symptoms may appear immediately after the accident or be delayed even though there be complete rupture of the intestine. Usually delayed symptoms are associated with partial rupture but cases have been reported of complete rupture of the empty jejunum, in which no symptoms appeared for at least fifteen hours. Moynihan, LeConte, and others have pointed out the difficulty of recognizing early a rupture of the first part of the jejunum in a patient who has not eaten for many hours. LeConte describes a typical case of a man injured at 8.30 a.m. who had not partaken of food since the evening before. Fifteen hours later he showed no signs of intestinal injury. During the next six hours the symptoms of ruptured intestine rapidly developed, the temperature became subnormal, the pulse steadily increased, respirations became rapid and thoracic in type, vomiting began, tenderness in the region of the umbilicus was complained of, tympany and distension developed, and the face became drawn and anxious. Operation revealed a complete rupture of the first part of the jejunum extending two and one half inches into the mesentery; in addition there was further injury to the mesentery and beginning gangrene of one foot of the intestine. It is in such cases that the early symptoms are so slight that the surgeon develops a false sense of security, and the patient is neglected till peritonitis excites more alarming symptoms, too late to be saved by surgery in the majority of such cases. Holland[18], Poland[19], Battle[16], Berry[7] and Guisseppi have reported cases with incomplete rupture which went on for days, weeks and even months before complete rupture developed followed by grave sequelae. In the great majority of cases symptoms immediately follow the rupture.

Primary shock develops in most patients almost at once after the rupture occurs. It usually is not intense if due to rupture solely. It may not occur at all, it may develop later, it may clear up quickly or pass on to secondary shock. Complete rupture or extensive laceration may not produce any primary shock whatever and on the other hand a single small perforation may induce grave shock. Apart from being associated with haemorrhage, the speed with which reaction from shock follows is no indication of the extent of the lesion. At least six out of fifty-nine cases reported by Berry and Guisseppi[7] showed no shock whatever, but continued their work, walked home or to the hospital. I have known several patients to have walked and dodged about from one shell hole to another even for two or three hours before lying down. Curtis[1] mentions two patients who showed no signs for twenty and twenty-six hours respectively. Shock was present, however, in eighty per cent. of his cases.

The temperature is usually subnormal at first, the *pulse* weak and thready, and the *respirations* are thoracic. The temperature rises with the reaction from shock and if it falls again and the pulse steadily increases in rapidity, serious trouble is present. The respirations become more rapid, shallow, and purely thoracic. Battle[16] and other authors state that a temperature even as high as 103° is an absolute indication of rupture of the intestine. Perhaps that is true, but in the cases I have seen it has been observed only in patients who came under our care too late for surgery and who already had localized or spreading peritonitis, but were offering a fair resistance to the infection. I cannot credit it as an early indication. A steadily increasing pulse-rate, if not due to haemorrhage, regardless of the temperature, is a grave sign.

Abdominal Facies.—The anxious, pale, drawn face, the alertness and apprehensiveness of the patient with ruptured intestine is almost characteristic. LeConte deplores the fact that he cannot paint it. He considers it almost diagnostic. No one of us who have seen many of these cases can ever forget that face. To my mind it is almost pathognomonic. It may come on early or late but it will be there sometime. In the late cases there is a peculiar listless expression, an absolute sign of extreme toxaemia from peritonitis.

Vomiting is a very important symptom and is invariably present. It rarely appears at the first except in a lesion of the duodenum or first part of the jejunum. It usually develops within an hour or two of the injury depending on the degree of primary shock and the reaction to it. The vomitus is rarely blood stained except when the duodenum is involved. It is stercoraceous and projectile later on. Nausea is usually present from the outset.

Pain and tenderness may be due to the superficial bruising only, but there is a deep, well localized type of pain, and particularly of tenderness, that is present in practically all cases. The type of deep pain and tenderness associated with intestinal rupture tends to radiate to the loins or deep in the pelvis, depending on the site and extent of the lesion and the reaction of the surrounding tissues to the infection.

Abdominal rigidity, either localized over the area of injury or general, is typical of the condition. It is present in all cases except a small percentage of patients in whom the "flaccid abdomen" is found. The latter is usually an indication of extensive multiple lesions of the small bowel, low down, in a patient with little general resistance. Early in my experience of such cases I recognized the almost inevitably fatal result, regardless of treatment. Progressive, board-like rigidity is usual and always indicates serious trouble. It was absent in four out of fifty-nine patients reported by Berry and Guisseppi[7]. Dulness locally over the area involved is common but it usually is a late evidence of nature's attempt to mat up the area about the rupture.

Abdominal distension and tympany may be due to paresis from the trauma apart from perforation. Increasing distension may be due to bleeding, escape of fluid content of the bowel, or to accumulating serous fluid poured out by the inflamed peritoneum. Increasing distension 8-10 hours after the appearance of the first symptoms is a grave sign. Very few patients recovered on whom I operated after distension had occurred when due to the last two causes.

Cutaneous hyperaesthesia over the site of injury is present in most cases but I cannot attach the importance to it as a diagnostic feature that Stanley[20] and others do.

Absent Liver Dulness.—LeConte, Berry, Moynihan and others agree as to the worthlessness of this sign in early diagnosis of ruptured intestine. Surely it is late evidence of serious trouble. It should be found in late cases only, or those that are inoperable for other reasons. Berry[7] states that in none of his seventeen successful cases had the liver dulness disappeared. On the other hand those patients on whom he operated after the liver dulness had disappeared all died. I did not have a single recovery of patients operated upon after the liver dulness had disappeared.

Table II

Sex—Traumatic Rupture of Intestine

	Makins, St. Thomas Hosp. 1889-1898	Berry and Guisseppi, 1893-1907 (10 London Hosp.)	21, Petry Prague Clinic and Literature	Hertle Cras Clinic and Literature	Cope and Johnson	Battle 1919	
Male	21	122	217	124	38	200	94.03%
Female	..	10	15	4	5	21	5.97%

Table III

Relative Ages—Traumatic Rupture of Intestines

Age	Gage	Hertle	Berry and Guisseppi	Cope and Johnson	
1-10 yrs	..	5	14	9	7.5%
10-20 yrs	8	14	32	10	17%
20-30 yrs	25	33	28	8	25%
30-40 yrs	6	35	18	7	19%
40-50 yrs	9	27	13	4	14.2%
50-60 yrs	4	17	14	1	9.7%
60-70 yrs	..	3	6	2	3%
Not Stated	..	7	7	..	3.8%

Dulness in Flank.—If present early, it is usually due to haemorrhage or escaping intestinal contents. If seen late, it is, as a rule, due to outpouring of serous fluid from the peritoneum, and is a serious symptom.

Surgical emphysema develops in a certain percentage of patients with rupture of the duodenum or colon retro-peritoneally. It is important to recognize it. In the presence of emphysema, on opening the abdomen the duodenum and colon should be explored thoroughly regardless of the other injuries found.

Blood may appear in the stool after partial rupture but rarely appears in complete rupture. It is of no value in the early diagnosis of ruptured intestine. The majority of reported cases have been in young, adult males.

Diagnosis of Intestinal Rupture.—The extreme urgency of an early diagnosis of spontaneous rupture of the intestine cannot be exaggerated. Delay of one hour at the critical period may take away the chance of recovery after operation. There is no one pathognomonic symptom of rupture. The subjective and objective evidence must be carefully weighed. The types of accidents producing such injuries must be appreciated. Persistent vomiting as the shock disappears, a steadily increasing pulse rate, localized or general abdominal rigidity, localized tenderness and deep pain, and later on the abdominal facies characterize most patients with intestinal rupture. Exact diagnosis may not be possible always, but a careful study of each patient will establish at least the need for operation. The question must not be, has the patient a ruptured intestine, but is there an intra-abdominal injury sufficient to demand an immediate exploratory operation? Delayed symptoms from an incomplete rupture must be looked for. The symptoms of septic absorption without evidence of peritonitis in a questionable case usually points to retroperitoneal rupture of the duodenum and occasionally of the colon with a spreading infection retroperitoneally. Having ruled out an abdomino-thoracic injury, renal trauma and spinal injury, give the patient the benefit of the doubt and operate on all patients who, having had a blow in the abdomen from a flying object, a kick by a horse, a crush or fall, etc., complain of severe pain in the abdomen, persisting more than four to six hours after the injury, accompanied by local tenderness, nausea and vomiting, a rising pulse-rate, and increasing local or general rigidity, not waiting for the other symptoms to appear. The associations of the classical symptoms of intestinal rupture vary with each case. Experience in large numbers of abdominal injuries develops diagnostic intuition in the keen observer that cannot be gained in any other way. He may not be able even to say why he knows, but he just knows that such and such a condition exists. I was much chagrined in the spring of 1915, after hurriedly opening an abdomen for ruptured intestine, to find no intra-abdominal lesion, but later to find a partial fracture of the spine with pressure on the posterior roots. Later, in the fall of 1918, I was strongly urged by an eminent neurological surgeon to operate for intestinal rupture on another patient, whom my associates and myself felt certain had no rupture but had a partial fracture of the spine which proved to be the case. Such operations were not rare during the war.

Prognosis and Mortality.—It surely must be accepted as a fact that practically all cases of complete rupture of the intestine are fatal unless operated upon. Spontaneous cures have been reported. Investigation of such reported cases proves that the evidence of there having been a complete rupture is not as a rule convincing. Rupture of the duodenum and first part of the jejunum are attended with a high mortality because very often they are not recognized sufficiently early. At operation rupture of the retroperitoneal portion of the duodenum and colon are often overlooked. Rupture of the jejunum is not so serious as rupture low down in the ileum, provided operation is early, because the intestinal content higher up is not so infective as lower down. There is more tendency to multiple perforations in the ileum and pelvic colon because of the bony apposition of the pelvis as well as the spine. Rupture of the large bowel. while it does not produce the same degree of shock, increases the possibilities of an infective peritonitis, does not respond to surgery as well, and is attended with a higher mortality than that following rupture of the small bowel. The most important factor in estimating the prognosis, apart from the site and multiplicity of the rupture, is the time that has elapsed since symptoms appeared before coming to operation. Provided the primary shock has been successfully overcome the earlier the operation can be undertaken the higher the percentage of recoveries. Cases, if possible, should be operated upon not later than six hours after the appearance of symptoms, and before peristalsis has recurred. Between six and twelve hours the mortality increases at least fifteen per cent, between twelve and sixteen hours it increases another ten to fifteen per cent., and after sixteen hours the percentage of recoveries is small. After twenty hours it is questionable if anything but a palliative operation such as Murphy's supra-pubic drainage operation should be undertaken, except in very rare cases.

Bouilly[22], in 1883, performed the first laparatomy for rupture of the intestine. In 1888, Croft[23] had the first successful operation Senn[24] collected 376 cases operated upon with a mortality of 51.6%. A survey of his analysis shows a very high percentage of recoveries especially of late cases and, as it represents collected cases, it probably contains a higher percentage of published successes than of failures, and must accordingly, be discounted somewhat.

SENN'S CASES

Operated upon—	Mortality
Cases within the 1st 4 hrs.	15.2%
" 5-8 hrs.	44.4%
" 9-12 hrs.	63 6%
" later than 12 hrs.	77%

Curtis, in 1887, reported 116 collected cases all fatal without operation. Homer Gage, in 1902, collected eighty-seven cases reported after 1887, forty-five cases, not operated upon, all died, forty-two were operated upon with seventeen recoveries, forty-two and one-half per cent. Of twenty-nine cases operated upon within twenty-four hours of the accident, thirteen recovered, and of four operated upon within the next forty-eight hours, two recovered. Five died within one hour of operation indicating that they were operated upon still suffering from shock or that the operation itself largely contributed to the death. LeConte, in 1903, reported a mortality rate, averaging between fifty to sixty per cent., in thirty-five cases, upon which he operated. Makins reported twenty-one cases operated upon at St. Thomas' Hospital between 1898 and 1906 with three recoveries. Berry and Guisseppi, in 1908, reported 132 cases of their own. One hundred and fifteen died, eighty-four were operated upon, seventeen recovered. Of the forty-seven not operated upon, all died. Eisendrath[25], Pelting[26], Kirstein[27], Cope and others published equally discouraging results. In 1914, Lincoln Davis[28] reported two recoveries after operation, approximately nineteen hours and two hours respectively after appearance of symptoms. During the war many cases were operated upon, with an approximate operable mortality of sixty per cent. In 1919, Battle reported a total of two hundred and twenty-one cases collected in Great Britain, including all cases of Croft's in 1888, those of Berry and Guisseppi, a list by Raymond Johnson[29] published in 1914, Makins' series, and later reports from St. Thomas' Hospital Records and other sources. One hundred and twenty-four were operated upon with forty-eight recoveries and seventy-six deaths. Gordon Taylor[30] and Berry[31] made some interesting contributions to the subject in 1921. Berry published a table showing the result of operation in collected cases.

	10 London Hosp. 1893-1907	12 London Hosp. 1908-1912	Zeidler Clinic, Petrograd 1897-1910
Cases admitted.......	132	44	52
Cases operated.......	84	30	49*
Recoveries after oper..	17	9	8
Percentage of recoveries	20.2%	30%	16.3%

Complications.—Approximately one out of every five cases of rupture of the intestine is complicated by the co-existence of other severe injuries. The complications are: Rupture of the spleen, rupture of the liver, rupture of a kidney, rupture of the pancreas, rupture of the stomach or bladder, rupture of the diaphragm and lung, mesenteric thrombosis, fracture of the pelvis, fracture of the costal margin of the ribs, and fracture of other bones.

Treatment

Operation at the earliest possible moment depending on the general condition of the patient is the only means of saving life. Peristalsis is inhibited in most cases of injury of small intestine for the first six hours and every effort should be made to delay peristalsis and to operate before it reappears. Patients should not be operated upon while shock is evident. Shock in such cases can be hurriedly combatted by heat, morphine, saline into the breasts and transfusion if necessary. Nothing should be given by mouth or rectum. Transfusion is indicated in all cases of extreme shock regardless of whether or not the patient has bled. It should not be employed in such cases, however, till other methods have been tried. Morphine should not be administered except in small doses till the decision is made whether to operate or not. The surgeon must not be deceived by the apparent improvement after administering morphine. Morphine is a gift from the gods and in its wonderful, soothing, sedative effect lies the reason for the so-called "expectant treatment," "armed expectation," etc., extremely dangerous methods masquerading under seductive terms. Having decided to operate, morphine should be administered to overcome the pain, restlessness and apprehension of such cases, and to retard the peristalsis already inhibited by the injury. Combination gas and oxygen anaesthesia with local infiltration of the abdominal wall with one-half per cent. novocaine should be employed. The abdomen should be widely opened by a paramesial incision over the area of contusion of the abdominal wall if possible. If no superficial bruising is present the incision should be planned to allow access to the area of deep tenderness. A definite routine should be developed in exploring the abdomen. Explore first the site of suspected rupture and if a rupture is found, cover it with gauze to protect the abdomen from soiling by further escape of intestinal content. Then start at the ileocecal junction and run the small bowel hurriedly but gently through the fingers, carefully viewing it as it passes through. If it is difficult to examine the bowel in this way, it is safer to gently eviscerate the small bowel, protect it with gauze wrung out of hot saline and then quickly explore it. Beginning at the caecum hurriedly explore the colon, palpate the spleen, kidneys, liver, stomach, bladder, and rectum. Bear in mind that multiple ruptures are present in twenty per cent. of cases. There is no surgeon who has had large experience in perforations of the intestine, who has not overlooked a perforation, to find it later at autopsy. Of eighty-four cases reported by Berry and Guisseppi, in fifteen no rupture at all could be found. Autopsy proved that seven of the fifteen had a rupture of the duodenum. In all doubtful cases carefully investigate the duodenum, jejunum, and colon. Resection of the large or small bowel should be avoided and is rarely necessary. Darn the perforation, laceration, or rupture even though complete. Unless the mesentery is destroyed over a considerable length, the viability of the bowel need not be worrièd about. If the glossy lustre of the intestine is present and it bleeds on being pricked with a needle, resection to avoid gangrene is unnecessary even in the presence of intense discolouration. Although I appreciate that many cases of gangrene at the site of suture have been reported, I personally have not had such a case since I quit resection for perforation. I resected many cases up till the middle of 1916. From that time to the fall of 1918, eleven hundred patients were operated upon in my hospital for injury to the intestine with only thirteen resections. Hurried darning with No. 0 catgut is sufficient for the smaller lesions and for a complete lesion a second re-enforcing layer of Lembert sutures of catgut is sufficient in the small bowel. For the large bowel I prefer at least two layers of sutures and reinforcing with linen or silk. The value of omental tags, not detached but sutured over the area of repair, cannot be over-estimated, especially in colon work. If resection is necessary, employ end-to-end anastomosis in small and large intestine alike. I have not yet appreciated the necessity for prolonging the operation to do lateral anastomosis. In extensive ruptures and contusion of the large bowel and of the duodenum palliative operations may be the limit of safety. The colon may be hurriedly mobilized and the severed ends delivered as for colostomy. If the duodenum is ruptured retro-peritoneally or the jejunum is torn across at its junction with the duodenum, it may be necessary to close off the proximal portion entirely and implant the jejunum into the stomach. Jejunostomy or ileostomy rarely save life in these cases. The recoveries from rupture of the duodenum are extremely rare. Berry could only find one successful case in the literature up till 1908. If they survive the operation, a duodenal fistula very often develops, followed by emaciation and death. Many successful cases were, however, reported during the war.

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*Of these forty-nine, ten were operated upon within six hours and five recovered. Of twenty-seven cases seen personally during the year 1914 to the fall of 1918, fourteen came under our care too late for surgery, or were complicated with other equally serious wounds, and died. Thirteen were operated upon with five recoveries. Rupture of the bladder complicated two of the eight fatal cases operated upon, and severe retro-peritoneal injury with involvement of a kidney was present in two others.

After repairing the rupture, the abdomen should be thoroughly mopped out with gauze wrung out of saline. *Abdominal irrigation or lavage was disastrous in our cases.* Careful records of the blood pressure showed that it was immediately raised but later fell ten to twenty, and even thirty degrees, below what we found in those patients who did not have irrigation. It also encouraged serous effusion into the peritoneal cavity and necessitated drainage. On the advice of a well known surgeon, we tried it on a small group of cases of perforation of the intestine, but abandoned it at once. Drainage is unnecessary except in patients operated upon late after peritonitis is well established and serous fluid is already being poured out into the peritoneal cavity. A suprapubic drain is then all that is needed. The abdominal wall should be closed in layers reinforced with through and through silk worms, if time permits it. Otherwise the abdomen should be hurriedly closed with through and through silk worm sutures. In patients with a fatty abdominal wall, it is a wise precaution to leave a wick of rubber tissue down just to the peritoneum at each end of the incision for the first forty-eight hours. During operation, and immediately after, it is advisable to keep up hypodermoclysis into both breasts and after operation a Murphy drip of five per cent. sodium bicarbonate and glucose should be carried on per rectum for the first forty-eight hours. Sips of tepid water or barley water may be given per mouth, but no purgatives should be administered. In a previous contribution[34], I pointed out the value of re-establishing the tone in the bowel above the site of rupture before closing the abdomen, by gently massaging the intestine from well above the collapsed area to well below it. Troublesome ileus did not develop after we instituted the method. It is apparently a question of re-establishing active circulation. Pituitrin or eserine may be employed if necessary to overcome distension. Morphine in small doses may be freely used to combat restlessness without any regard to the dread of intestinal distension.

What are we to do with the late cases, already markedly distended, tympanitic, vomiting continuously, and with general or localized peritonitis? All active surgical measures to combat peritonitis etc., are valueless, in fact, destroy the little chance the patient has. Enterostomy to overcome distension from obstruction rarely saves the patient. The administration of morphine in large doses till the respirations are reduced to twelve to fourteen to the minute, heat to the abdomen, saline per rectum, and in the breasts, are all that can be done. I believe I have seen at least a few cases of undoubted perforation by penetration recover without operation, and an occasional recovery after spontaneous rupture has been reported. In these cases a localized abscess forms that later requires drainage only. Mr. Gordon Bell[35], during the war, had an undoubted case of spontaneous healing of perforations of the small intestine from a gunshot wound. The man was later wounded and died, and the intestine recovered at autopsy.

Conclusions

1.—The extent of the injury to the abdominal wall is no indication of the amount of damage to the viscera.

2.—It is practically an undisputed fact that complete rupture of the intestine, not operated upon, is invariably fatal.

3.—The small bowel is involved much more frequently than the large, in the proportion of nine to one. The rent is usually transverse and multiple rents occur in one out of every five cases.

4.—Bearing in mind that after rupture of the small bowel the mucous membrane generally everts through the rupture and tends to prevent leakage and that peristalsis is inhibited for approximately six hours, operation not delayed beyond six hours gives by far the best chance of recovery.

5.—The death rate has been over seventy per cent. Only by early diagnosis and operation as soon as the patient can stand the surgical interference, can the mortality be reduced. The mortality should not be more than forty to fifty per cent. in civil accidents.

6.—The early symptoms of complete rupture of the intestine are few, but very characteristic.

7.—If the abdomen is distended and the liver dulness absent operation is of little value.

8.—Last resort surgery in such cases is of no value, in fact takes away the only chance the patient has. Advocate invariable intervention even in doubtful cases, though it may be purely exploratory.

9.—In all cases whether the diagnosis is doubtful or not, bear well in mind that the important question to decide is not—"Is there a rupture of the intestine?" but "Is there an intra-abdominal lesion sufficiently serious to require operation as soon as the patient's condition will permit of it?"

10.—The profession generally should thoroughly appreciate that if a man is kicked in the abdomen or otherwise injured there, even though he may not appear acutely ill at the outset, and if he complains of persistent pain, he should be sent to the hospital or at least kept under hourly observation until all danger of a ruptured intestine is passed.

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RUPTURE OF THE BLADDER

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RUPTURE of the bladder by violence is a rather rare accident and this is especally so in children, yet within the last few months I have seen two cases. The first was in the practice of Dr. Sneath of Dromore. On the evening of April 29, 1922, he saw a little girl four years old who had fallen off a waggon loaded with stones, and it was supposed that either she had struck the hub when falling or that the wheel had passed over her. The accident happened at 3.30 p.m. and Dr. Sneath saw her at 4.15 p.m. She was crying and complaining of abdominal pain and tenderness but there was no marked rigidity. She had vomited a couple of times, was pained, had a rapid pulse, and slightly subnormal temperature. Dr. Sneath diagnosed severe inter-abdominal injury and advised operation. At eight o'clock I saw the patient and found very little change had taken place in her condition, abdominal pain was not acute nor was there much tenderness, there was dullness posterially. I concurred with Dr. Sneath in advising a coeliotomy which was immediately done. The abdominal cavity was found to contain a considerable quantity of urine which had escaped from the bladder through a tear of a little more than an inch long in the fundus. The abdominal cavity was thoroughly cleaned by irrigation with warm normal saline solution rapidly introduced in large quantities through a rubber tube of wide calibre. The tear in the bladder was stitched with plain catgut, care being taken not to include the mucous membrane, and over this a Lembert suture was put in. There cannot be too much care used in doing the stitching for the place must be made water tight. Absorbable material should be used, for if by any means a stitch should penetrate and be exposed in the bladder, it will, if not rapidly disintegrated, be thrown off into the bladder and possibly become the nucleus of a stone. The bladder opening being closed, a final thorough irrigation was done, leaving no part of the cavity contaminated. The abdominal wound was closed in the usual manner and the catheter left in the bladder for eleven days when recovery was complete. This case recovered without a bad symptom, not even a rise of temperature.

The next case occurred in the practice of Dr. McLellan of Holstein. A boy of thirteen was struck by a plow handle in the lower abdomen and so little importance was attached to the accident and so comparatively light were the symptoms that he tried to continue working and it was not until twenty-four hours after the accident that Dr. McLellan saw him. He then had tenderness over the whole abdomen with dulness and distension in certain areas. A diagnosis of probable serious internal injury was immediately made and prompt operation advised. He was brought to the hospital at once and the abdomen opened thirty-one hours after the accident occurred. The cavity was found full of urine and the peritoneum intensely congested. A rent was found in the fundus of the bladder, running transversely and about an inch and a quarter long. The abdominal cavity was thoroughly cleaned out by irrigation which was rendered more difficult on account of many recent adhesions. The opening in the bladder having been closed as in the previous case, the peritoneal cavity was again washed out with meticulous care. The abdominal wound was stitched and a catheter fastened in the bladder; he was put to bed and progressed favourably until the tenth day when symptoms of obstruction appeared. The abdominal wound was re-opened and it was found that some of the adhesions had re-united. These were separated and the abdomen closed. The tear in the bladder was perfectly healed. From this time on recovery was uninterrupted. The prompt recognition by the physicians first called of the seriousness of the cases and of the urgent need of operation were the factors which made success possible. In abdominal injuries many lives are lost through delay in waiting for positive signs of definite damage to some viscus. When with the lapse of time the case becomes clinically clear, it is usually surgically hopeless. The only safe rule is when in doubt open the abdomen, for any other course is that of ignorance in trusting to luck. So slight are the symptoms in some cases of rupture of a viscus that the injured person is able for hours to go on with his work and therefore no time should be lost because the symptoms do not seem urgent. I cannot too strongly urge the thorough cleansing of the abdominal cavity when it is filled with foreign matter for upon this as much as upon anything else depends the issue. Failure to properly clean the peritoneum has been the cause of many deaths and it is the less defensible since it is so easily done and because the patient's condition will improve during the doing. To clean the peritoneum with sponges or mops when the whole cavity is filled with urine or pus is impossible and the surgeon who trusts to that method will have an unnecessarily high death rate.

EMPYEMA AND ABSCESS OF LUNG*

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IN the limited time at one's disposal it is quite impossible to cover in any detail the surgical treatment of empyema and abscess of the lung. Empyema has been so forcibly brought to our attention during the late epidemics of influenza that anything I might say on this subject could not possibly add to what has already been written. I shall therefore discuss empyema very briefly and in a general way, and go perhaps a little more into detail in dealing with lung abscess.

The principles underlying the proper treatment of both these maladies is simply an application to specialized diseases of well established surgical principles. In a word one must provide adequate drainage for an empyema or a lung abscess, whilst at the same time protecting the neighbouring tissues and organs from damage. The latter is fully as important as the former and is very frequently forgotten in our zeal to treat the disease.

Just what method we choose to adopt is of no consequence so long as we accomplish our end

Empyema.—The first essential for treatment, be it medical or surgical, is to know the infecting organism. For this reason an exploratory puncture and, if possible, a bacteriological examination is very much to be desired. Should this reveal the fact that the empyema is due to the pneumococcus, the treatment is simple; *adequate drainage* whether by (a) aspiration; or (b) by thoracotomy and closed method of drainage; or (c) thoracotomy with rib resection. It would appear that pneumococcal empyemas do best with rib resection without preliminary aspiration or closed type drainage, but any of these methods willl be effectual in pneumococcal cases if the drainage is adequate.

Should bacteriological examination show the infecting organism to be a streptococcus, then the condition is much more grave and the treatment correspondingly more complicated.

Streptococcal empyema may be discussed under three headings, *viz.*, early, late and chronic. By "early" we shall mean those cases which become evident before the pneumonia has subsided. Under "late" empyemas we include those treated after the original lung condition has completely cleared; while three months after the pneumonic symptoms have subsided may be taken as an arbitrary date for the beginning of the "chronic" form. The early cases should all be treated medically, that is, by aspiration. This should be repeated every day or every second or third day as circumstances require, until a cure is effected or until it is evident that aspiration will not cure. A certain percentage of cases are cured by simple aspiration and the earlier this is begun the better the chance of cure. The majority of cases however require more efficient drainage than aspiration. For these other cases, especially if it is still early in the disease, it is probable that thoracotomy and closed drainage does best. This is a very simple procedure which can be done in any country home without removing the patient from bed. All that is required is—a trocar, a cannula and a catheter, which will just snugly fit the latter. Under local anaesthesia, preferably one-half per cent novocain, one raises an intradermal wheal one-half inch in diameter, and then injects about a drachm of solution so as to infiltrate the intercostal tissues and pleura. After waiting ten minutes for the anaesthesia to take effect, one inserts the trocar and cannula and then withdraws the trocar immediately replacing it by the catheter to which has been attached a long rubber tube, the distal end of which is under water. It is always wise to cut a second opening in the catheter opposite to and one-half inch above the eye. The catheter is carefully strapped to the chest in order to render the opening air-tight. Opinions differ as to the best method of treating cases where closed drainage is used, but the majority of people seem to favour irrigation with hypochlorite solution (Dakin's). If this method is adopted it is always wise to use saline for the first irrigation, because should there be a communication through into a bronchus Dakin's solution might set up very severe coughing.

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There are many complicated methods of irrigating an empyema, but time does not permit discussion of these. A fairly high proportion of cases recover under this closed method of drainage, but certain cases require even free drainage and for these must be reserved thoracotomy with resection of a piece of one or two ribs. This should be done only after all inflammation in the lung has subsided and after adhesions have had time enough to form and so prevent collapse of the lung. The technique of this operation is so well known that it requires no description. The only points I wish to urge in this connection are: (1) Do not do it too early; (2) do it under local anaesthesia; (3) allow the contents to escape slowly; (4) explore the cavity thoroughly to make sure that all pockets can drain freely, and remove all the mass of lymph which might impede drainage. I think that these cases do better if irrigated with Dakin's solution.

When we come to deal with chronic empyema, we are confronted with a very trying series of cases. I feel sure that early and adequate drainage would prevent a great number of cases of this disabling disease. In treating chronic empyema one should lean toward conservatism, and reserve all mutilating operations for those cases which will respond to no other treatment. The first essential in treating these cases is very free drainage and here one should resect sufficient rib to permit of thorough exploration of the cavity, so that all pockets may be opened and any bands which are obstructing drainage may be broken down.

Following this I think the ideal care can be given by means of the "Taylor tidal wave" which, as most of you know, provides very efficient irrigation combined with free drainage. I think the great advantage of this method is that the irrigating fluid reaches small sub-pleural lung abscesses and other badly-draining pockets which can be reached by no other method of irrigation. Under this treatment the thickened pleura tends to become more pliable and the lung correspondingly expanded.

Should this method after a fair trial not accomplish a cure, the next step should be some type of decortication operation. Of these the least damaging is the viscero-parietal decortication combined with deep scarification of the remaining visceral pleura, in such a way as to divide it into little squares with the incision going right through the pleura. This permits of a very satisfactory expansion. At the time decortication is done, all infected foci should be removed. This operation should be done only after efficient sterilization of the cavity by irrigating it as described. For the few cases which this type of treatment fails to relieve, one must resort to some type of extensive rib resection with collapse of the chest wall. Inter-lobar empyema should be treated in exactly the same way as lung abscess.

Abscess of the Lung.—My part in this symposium is limited to its surgical treatment; but the surgical treatment cannot be discussed entirely by itself for two very good reasons, (1) because surgical treatment is not required in some cases of abscess of the lung, and, (2) because it is unwise to undertake an operation of this kind until the patient has been put through a preliminary course of medical treatment. This preliminary treatment is of prime importance and I shall deal with it first. In the second and third parts of my paper, I shall discuss the technique of operation and post-operative care, including complications.

Preliminary Treatment.—The preliminary treatment which I am going to recommend is important for two reasons: First, it may render an operation unnecessary, and second, it is the best preparation for an operation, if an operation should prove to be necessary. For these reasons all cases of lung abscess should be given at least three weeks of what we might call strictly medical treatment, consisting of: (1) rest in bed, in the fresh air if possible; (2) full diet. This is most important. The patient should be fed up to the limit with nutritious foods; (3) administration of alkalies with the idea of reducing the zone of penumonitis and tissue cytolysis which is always found about an abscess cavity; (4) postural treatment aimed at finding the position in which the abscess drains into the bronchus if there be such a communication. The patient should assume this posture at least four times daily, remaining fifteen to twenty minutes or longer, if necessary to completely empty the cavity.

Three or four weeks of this kind of treatment will sometimes effect a cure. However, if physical signs, confirmed by x-ray, show that the abscess is still persisting, it is advisable to resort to surgical drainage. In that case the preliminary treatment has rendered the operation safer: (a) by improving the general condition of the patient; (b) by reducing the zone of pneumonitis about the abscess through alkalinization; (c) by giving the surrounding tissues time to become more or less fixed, especially the mediastinum, thus rendering the abscess a more localized disease; (d) by showing accurately the location and outline of the abscess.

In operations for lung abscess the closest cooperation of the radiologist with the surgeon is essential. I depend much more upon the localization of an abscess as marked out by a competent radiologist than upon the physical signs elicited by ordinary means. I have the radiologist localize the abscess by fluoroscopy and have him give me three points as guides, *viz.*, anterior, posterior and lateral. One can in this way determine pretty accurately the part of the chest wall from which the easiest access to the abscess is to be had. The abscess should be opened where it comes nearest the surface. In this connection one might state that, generally speaking, abscesses of lower lobe are best approached from behind, those of middle part of lung from the axillary region, and those of the apex from the front. As a rule genuine pyogenic abscesses of the apex are easily got at on account of their nearness to the chest wall. Right here let me warn you to operate on no abscess of the apex without first eliminating the possibility of tuberculosis. All operations on abscesses of the lung should be done under local anaesthesia in two stages, unless it is evident that the visceral and parietal pleura are adherent.

Technique.—Under paravertebral blocking of four to six intercostal nerves or local infiltration anaesthesia of a good sized area, a curved incision is made, raising a flap at least four to six inches in diameter. This should include skin and muscles so as to expose ribs and intercostal muscles for four to six inches. Then resect at least four inches of two, or preferably three, ribs subperiosteally. This wide excision of rib is important as it mobilizes considerable chest wall and leaves the cut ends of the ribs far enough from the field, which will later become infected, thus partly eliminating danger of osteomyelitis of the rib.

Then one inserts a suture through the intercostal tissues and the parietal and visceral pleura, in such a way as to accurately approximate the visceral to the parietal pleura. This row of sutures should be placed very carefully so that the pleural cavity will be absolutely shut off from the filled of operation. This circular suture should take in an area of at least two and one-half inches in diameter in the case of small abscesses, and a greater area if the abscess is large. The type of suturing best adapted for this purpose is one known as the Roux stitch, whereby each bite of the needle takes in about three-quarters of an inch of tissue, including intercostal muscles and both layers of pleura. The next stitch goes back half the distance of the first and emerges the same distance in front. Never try to suture parietal and visceral pleura without taking in some tissue from the chest wall, as the parietal pleura is practically sure to tear if sutured alone. The flap is then dropped into place and dressings applied, thus completing the first stage.

One week later the second stage of the operation is done, again under local anaesthesia. The same flap is raised, all bleeding controlled, and the parts well retracted to give good exposure. Then the whole field is smeared thickly with ordinary vaseline, paying particular attention to the cut ends of the ribs. With a large bore exploring needle, locate the abscess and then with a soldering iron, or a cautery, at a low heat, preferably not even red, one follows along the needle into the abscess cavity. This should be done rather slowly and by cauterizing a much greater area at the surface than deeper. In this way one produces a funnel-shaped opening into the abscess cavity. As soon as the cavity has been opened, the patient will probably cough if there is any communication with the bronchus. This may be rather troublesome for a few moments and is due I think to the fumes from the burning tissue irritating the respiratory mucosa. Having made sure that the superficial part of the opening is wide, at least two inches if the abscess is at all deeply placed, one again smears all bare surfaces with vaseline and places a spirally cut rubber drainage tube one-half inch in diameter into the abscess cavity and then lightly packs the remainder of the cavity with gauze. Replace the flap, and suture only enough tissue to hold it in place. I have cut a circular opening directly over the opening in the lung and brought the drainage tube and gauze out through it. In such a case one can suture the flap back into position.

Post-Operative.—The post-operative management of these cases calls for considerable care. The primary dressing should be thick enough to practically prevent any sucking in of air through the drain. I have recently been in the habit of covering the tube and surrounding tissue with a moderate dressing. Then I put on a sheet of rubber dam large enough to extend well beyond the dressing and then apply more dressings and fasten firmly. I encourage the patient to lie on the affected side at night and to continue the postural treatment at intervals during the day. The dressings are changed as required and if the packing is foul and the patient will permit it, I instill enough hypochlorite (Dakin's solution) to deodorize.

The packing is left in position until it becomes quite loose when I withdraw a little each day. I have not been in the habit of repacking the abscess cavity, but I do put a little gauze into the wound in the chest wall and pack it gently about the tube. This is best changed daily or every other day. If there is a tendency towards flapping of the mediastinum it is wise to place a square of rubber dam over the skin and drain. The drainage is not interfered with. This rubber dressing produces a very satisfactory seal which effectually prevents the sucking of air and purulent material into the bronchi. I feel that this method of dressing has saved at least one case whose chest was rapidly filling up—and whose condition had become alarming.

Complications.—In the order of their importance they are: (1) Empyema; (2) extension of infected area about abscess; (3) flapping of mediastinum which brings about an antelectatic condition of the lung on diseased side; (4) haemorrhage; (5) infection of chest wall, cellulitis, osteomyelitis, etc.; (6) bronchial fistula; (7) paralysis. The chance of the occurrence of most of these complications can be lessened, if not entirely eliminated, by careful attention to detail.

THE SURGICAL TREATMENT OF CEREBRAL CONDITIONS CAUSING INTRACRANIAL PRESSURE*

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THE task which has been set me to-night is a most difficult one and had I chosen the title it would have been "The Surgical Treatment of Intracranial Pressure," for in my experience it is easier to treat intracranial pressure than it is to know exactly what cerebral conditions cause it. The surgical treatment aims firstly at the relief of the pressure and secondly at the removal of the cause if such be possible, so that the treatment of the cerebral condition is secondary to the treatment of the pressure. If the order of treatment were reversed, the opportunity of affording relief of pressure would undoubtedly be lost, in a majority of cases, in an endeavour to ascertain the exact nature of the condition.

Our knowledge of the anatomy and physiology of the brain gives us an understanding of the ease with which intracranial pressure may occur, and also how nature has endeavoured to safeguard it against the possibility of such an occurrence by dividing the cranial cavity into three compartments by means of the falx cerebri and the tentorium, and by affording an outlet for the cerebro-spinal fluid into the spinal canal, an assisting factor whereby 3 to 6% of the cranial capacity may be encroached upon without the onset of pressure symptoms.

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In order to facilitate the outline of surgical treatment the intracranial pressure may be divided into two large classes according to the duration of the onset: (1) Rapid intracranial pressure from injury with haemorrhage or oedema; (2) Slow intracranial pressure from tumour.

1.—*Rapid intracranial pressure*—In head injuries four-fifths of the patients suffer from shock which must be treated first no matter how severe the injury. Even when a large haemorrhage has occurred at the time of the injury, the low blood pressure attending the shock prevents any further haemorrhage. If the patient does not survive the shock the injury was of such a severe nature as to exclude the possibility of any aid which might have come from a decompression operation. Non-operative treatment in mild cases, which comprise about two-thirds of all patients, is usually successful, while operative treatment is necessary in the remaining one-third. In the mild cases the injury may have given rise to extra-dural haemorrhage with some laceration or contusion of the brain, the latter accounting for the pressure; or a small subdural haemorrhage, a laceration or contusion producing a limited degree of oedema, or a combination of all has occurred. In the severe cases a large subdural haemorrhage, or an extensive laceration and contusion with odema, or both have occurred. A consideration of the force producing the injury may aid one in estimating the extent and variety of the lesion. A direct blow or fall from a height will always produce more laceration and contusion than a compressing force. In a direct blow the injury due to contre-coup is often the major lesion and the laceration and contusion give rise to varying degrees of oedema. It is the oedema which gives the gravest concern and it is the oedema involving the medulla which causes the death of the patient.

After the patient has recovered from the shock, as indicated by the blood pressure and pulse, the decision for a decompression operation is based upon the condition of the retina and the cerebro-spinal fluid pressure. When there is a rapid increase of this pressure above 16mm. of mercury as indicated by lumbar puncture and the mercurial manometer; when the discs show oedematous obscuration to the degree of an early papilloedema; and when increasing paralyses of the extremities occur along with the usual symptoms, there should be no hesitation in operating immediately. To delay operation at this stage would be to court the onset of a medullary oedema and collapse.

If, after the shock has been relieved, these signs and symptoms which determine operation are absent, the case is a mild one and the careful withdrawal of 10 c. c. of the cerebro-spinal fluid may give great relief. This procedure may be repeated 5 or 6 times at varying intervals and as much as a total of 50 to 100 c. c. withdrawn. When operation is not indicated the withdrawal of the cerebro-spinal fluid is accompanied by other forms of palliative treatment which aim at securing rest, cold to the head and catharsis. In a severe case, however, the attempt to withdraw a quantity of cerebro-spinal fluid by lumbar puncture when the pressure is 16 to 20 mm. or higher may prove fatal by the sudden compression of the medulla in the foramen magnum.

In this first class, then, the decision for operation depends upon the eye changes and the cerebro-spinal fluid pressure. Other signs and symptoms may, or may not, be of value in making the decision.

2.—*Slow intracranial pressure.*—The tumours producing a slow onset of intracranial pressure are the sarcomata, endotheliomata, the fibromata and the carcinomata. The glioma is an infiltrating tumour and seldom gives rise to intracranial pressure. A cyst may be the cause, or tuberculomata or syphilomata. These tumours produce a direct compression force which increases up to the point where an invasion of the brain substance occurs. Any of them may also be complicated by the presence of an internal hydrocephalus due to a blocking of the veins of Galen or the prevention of the normal transudation from one ventricle to another.

The surgical treatment of tumours depends upon the ability to locate the position of the tumour. When the tumour is diagnosed in a certain area the procedure is a radical operation which aims at the removal of the tumour. When, however, the tumour cannot be definitely diagnosed, a subtemporal decompression is undertaken for the alleviation of the symptoms caused by the intracranial pressure of which sight, headache, fits, and emaciation from vomiting rank in the order of their significance. In this second class where the pressure is of slow onset the decision for operation rests mainly upon the eye changes.

Operative Procedures

Subtemporal Decompression.—This operation is undertaken for injuries with haemorrhage or oedema and for tumour or other conditions producing pressure when the condition cannot be definitely diagnosed.

The advantages of the subtemporal operation are:

(1) It is the silent area of the brain.

(2) The squamous bone is thin.

(3) It is the most frequently involved area. Bony lesions so frequently occur in the middle fossa and cerebral contusions are especially liable to involve the tip of the temporo-sphenoidal lobe.

(4) There is no danger of paralyses following protrusions of the brain through the opening.

(5) The temporal muscle makes possible a firm closure and more support.

(6) The exposure of the meningeal territory and the ease of determining the presence of an extra-dural haemorrhage.

A vertical incision is best as the temporal artery is secured where cut and, unlike the curved incision its many branches are left intact. It ensures an easier enlargement of the bony opening downwards and the strong attachment of the temporal muscle to the parietal crest is preserved.

When the operation is undertaken for tumour, the decision to explore the brain through the decompression opening must be governed by the patient's condition. In the presence of certain injuries, abscess or hydrocephalus drainage must be instituted.

In the absence of other indications the decompression is undertaken on the right side so as to avoid any possible injury to Broca's area.

Radical Operation.—This operation is performed when a tumour has been definitely diagnosed. Sir Victor Horsley stated that the palliative operation of decompression should be the exception and radical operation the rule in brain tumours. Many tumours cannot be definitely localized, however, and time must not be lost in the attempt, especially when optic atrophy is imminent.

The choice between craniotomy and craniectomy must be determined by the location of the tumour and the size of the proposed opening. When the surgeon wishes to expose a large area in relation to the motor area the bone-flap operation should be done. When, however, time is a serious consideration, and when operating in the cerebellar region, craniectomy must be done.

In certain cases where the patient's condition is poor, the operation may be divided into two stages, the first ending at the dura mater. The second is then undertaken within a week.

When the dura is exposed it may show loss of pulsation; it may be anaemic from pressure, reddened from vascularisation, opaque from the presence of an underlying cyst, plum-colored from subdural haemorrhage; it may be oedematous, adherent, or gray-brown from the presence of a malignant mass. Fluctuation suggests cyst while increased solidity points to a tumour.

After the dura is opened, exploration should be undertaken only when the diagnosis is reasonably certain.

If the tumour when found is extensive with ill-defined margin, it should be left and the surgeon should remain content with relief of the pressure. If he has employed a bone flap, he may cut a circular area from the inferior border of the flap to ensure a relief of pressure and then replace the flap.

When a circumscribed tumour has been shelled out, light packing with dry plain gauze may be necessary to control the bleeding. When a cyst cannot be removed intact, the wall should be dissected out when possible.

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SOME CEREBRAL MANIFESTATIONS OF GENERAL INFECTION*

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CERTAIN of the cerebral manifestations of infections such as delirium create but little interest, the experience of the ages having taught us that we can never correlate the delirium with the anatomical findings; certain others such as coma and convulsions, in adults at least, interest us in that they increase the gravity of the prognosis and upset our calculations for the autopsy table but little less often. For these reasons we find that it is with the more sharply localized manifestations or with manifestations more clearly psychic that the bystander most concerns himself.

An integral part of clinical medicine, the cerebral manifestations of infections have been frequently dealt with, and their causation ascribed to many conditions, such as the height of the fever, the presence in the blood of urea in increased amounts, or coincident nephritis or nephrosis. An observer of 60 years ago, C. H. Bastian, was convinced that plugging of cerebral vessels with thrombi explained all nervous symptoms. Murchison is clear, however, in his statement that "the severest nervous symptoms may be seen in cases whose brains showed little or nothing to a practiced eye," and the remarks of Stokes, the then celebrated student of the fevers of Dublin might well be remembered to-day—"Symptoms of inflammation of the brain do not necessarily indicate inflammation if the case is one of typhus, even such symptoms as inequality of pupils, strabismus, muscular rigidity, and perhaps opisthotonus may be present without inflammation."

To-day perhaps, our ability to detect conditions in the cerebro-spinal fluid has helped to explain some of the many cases with a meningeal syndrome, and the finer histology has given us the recognition of vascular and peri-vascular changes in such conditions as syphilis, encephalitis, and polio-myelitis, without evidence of gross changes. We are the further advanced by these improvements; never-the-less, the uncertainty of being able to demonstrate lesions to correspond to symptoms of cerebral involvement still exists; there is this comforting fact, however, in the consideration of many of the cerebral manifestations of general infections—the most severe symptom may be recovered from.

The common infections seen in a general hospital—the pneumonias, typhoid, influenza, septicaemias, rheumatism, and erysipelas have a varied assortment of cerebral manifestations; meningitis, common to all, (especially to the pneumonias and to the septicaemias), I am not considering, its very evident group of symptoms and the results of lumbar puncture usually dispel doubt. The appellation "meningism" well describes the condition we frequently see in the infections—active meningeal symptoms with clear spinal fluid under pressure and with increased cell count. This must be considered as meningeal irritation at least, though often only part of a general process of infection and very frequently recovered from. In cases ending fatally, singularly little may be found. In the respiratory infections, aside from delirium, the cerebral manifestations are few and the anatomical findings fewer. In no type of infection is the diagnosis of cerebritis or meningitis so often made, especially is this the case in children; the difficulty is in these cases to observe both the clinical course of the disease and the brain sections: amongst 120 cases actively delirious, I have recorded one with rigid neck, internal strabismus, and recovery; one with rigid neck, positive Kernig and Babinski sign, with recovery; one with rigid neck, the same positive signs, death, but no meningitis. Clear spinal fluids were found in all these cases.

Coma as an early cerebral manifestation of respiratory infections is unusual, and was a fatal sign in all of eleven cases beginning in this way: convulsions, early or late, were equally ominous, in adults. Four convulsive cases all died: one, with the typical signs and symptoms of meningitis in addition, showing, however, only the familiar oedema and congestion of the brain: no exudate, no organisms. A second showed flaccid paralysis of an arm and deviation of the eyes with his fatal convulsions, presenting a combination suggestive of some more localized pathological change. Psychic manifestations at onset, so pronounced that they separate themselves from the simple febrile delirium and the signs of the infection, are rare. Two instances of delusions of persecution were in my series, another was diagnosed as "dementia precox developing in an epileptic." We are more familiar with the forms seen after crisis or lysis, "post critical delirium or psychosis." These are by no means uncommon and they are the more protracted if the case has had an alcoholic history. Ptosis, amblyopia, lethargy and nystagmus were unusual and transient manifestations occurring once each in a series of 350 cases: the two first would probably be considered as peripheral lesions.

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There is no convincing pathology to offer; thrombosis, rare in pneumonic infections, is suggested in the case showing convulsions and monoplegia;—later case with rigidity of the left arm, paresis of the left side of face and semi-consciousness, went on to abscess formation in the lungs: there were thromboses of the peripheral veins in this case and thrombotic softening of part of the right cerebrum. No good instance of encephalitis (diffuse or focal), embolism, or haemorrhage, proven by autopsy, has occurred in my series; both encephalitis and haemorrhage are recorded, however, in respiratory epidemics such as have been seen of late.

The last hundred cases of typhoid in the Toronto General Hospital have shown singularly few cerebral manifestations apart from the early delirium, nor have I found specimens illustrating the thrombosis, meningitis or encephalitis which Osler considers the common anatomical changes in the cases with marked cerebral involvement. One case of deafness occurring early was considered a peripheral lesion, a neuritis, and was recovered from; it occurred coincident with a fatal laryngeal and and pharyngeal paralysis; the direct cause of the paralyses in this latter case remained unproven in the absence of autopsy. Such conditions are referred to by the older writers and considered as analogous to the lesions of diphtheria. The following history illustrates one of the most severe cerebral manifestations of typhoid with a definite localization:—In the third week of a severe typhoid when the fever was subsiding, Mrs. A., 35 years of age, began to develop rigidity of her neck: her right arm and leg became rigid and she was quite unable to make more than a few incoherent sounds: after ten days of added delirium and weakness there was a gradual improvement and she went out recovered (save for some slight stiffness) and able to speak. Similar conditions are referred to more frequently in the course of typhus fever; they are considered as due to thrombosis, arterial or venous, and many good examples of this have been demonstrated. In the experience of some observers a focal encephalitis has seemed to be the cause. Not every case recovers as completely as did the one reported, for permanent rigidity and paralysis may remain. I have had no experience with the temporary aphasia reported in the typhoid infections of children.

No discussion of cerebral manifestations of typhoid is complete without a detail of the psychoses of this infection; their occurrence as an early delirium, as an aberration later in the fever, or as a condition in convalescence may be mentioned; they do not depend upon the severity of the attack. Dr. Rudolf allows me to describe an interesting case from his service:—Richard A., with a severe infection became fatuous, childish and tearful as his temperature fell; he was increasingly so in convalescence. A gall-bladder infection developed and later he relapsed: with the relapse active delirium for a few days, but as he cleared up he was seen to be free from his fatuity and quickly became normal. These psychoses are noted as usually being recovered from, though at times their course may be prolonged. Of unusual interest in the typhoid series was the development of typhoid in a case of chorea; the choreiform movements subsided as the disease progressed (case of Professor Rudolf).

It was expected that the influenza epidemic of 1919 would give us many instances of brain involvement; in this we were mistaken, for apart from the delirium of the severe and fatal cases, few nervous manifestations were seen. The supposed dependency of encephalitis upon preceding influenza was considered in this connection, and in the three hundred cases nervous signs and symptoms were regularly looked for.

In a few patients transient weaknesses of the eye muscles were observed, some pneumonics showed the meningeal irritation so often referred to, but real cerebral involvement was not a part of the last epidemic.

With the various septicaemias and with rheumatic fever are seen the best examples of real cerebral changes. The older descriptions of encephalitis, the forms distinct from the lethargic encephalitis, deal largely with lesions seen in the endocardial cases or in cases of acute sepsis; leaving aside the symptoms due to large emboli, we find many interesting histories.

A.—In one case paresis of legs, diplopia, ptosis, divergent squint and lethargy followed an active diverticulitis and abscess of the rectum, which in turn had seemed to follow upon an infected hand; weeks of unruliness and childishness ensued and there were, in addition, remarkable spasms of the abdominal muscles—a persistent white cell count of 20,000—40,0000, seem to indicate active infection. There was complete recovery.

B.—Two weeks of extreme restlessness with severe hyperaesthesia, confusion, then coma, with left facial weakness, was the history in a case with extensive endocarditis of mitral and aortic valves due to a staphylococcus aureus infection; multiple embolic abscesses were found in the brain sections.

C.—Headache, aphasia, and staggering gait preceded by some days the hemiplegia and unconsciousness in another case of mitral and aortic endocarditis with streptococcus haemolyticus infection: gross haemorrhages and pinpoint haemorrhages throughout the brain were the findings. These are the types of cases in which the extensive sub-arachnoid haemorrhages are prone to occur.

Coma, long recognized as a symptom of endocarditis, was only noted as late-occurring in the cases I have been able to review and to control with an autopsy record; mania of four weeks' duration preceded death in one case of the subacute form of bacterial endocarditis, and for months previous, this very powerful man had suffered from phobias of unusual sorts and would wander lost for days. Of the cases with distinct rheumatic history and endocarditis, and with careful post-mortem examinations, two may be detailed.

1.—A young woman with recurring attacks of acute rheumatism and a mitral valve lesion, became very irrational, had delusions and would wander from home. Two months after these mental features had been noted she had another attack of acute rheumatic fever, she was emotional, had active delusions, and after a few days became delirious and died. At autopsy, mitral endocarditis, oedema and congestion of the brain, with an area of softening posterior to the caudate nucleus were found.

2.—A woman of 53 with a history of repeated rheumatic attacks entered the hospital in a state of absolute coma. There were no paralyses; for two months she had been worrying, had been excitable and had had delusions; a loud systolic murmur was evident on examination; a rheumatic endocarditis, multiple petechial haemorrhages in the brain, and a haemorrhagic pachymeningitis was found. These cases showed nothing bacteriologically.

One may recognize from these details that cerebral manifestations of various sorts are to be looked for in many of the infections, their pathology is evidently very varied and their seriousness would seem to depend much more upon the nature of the infection than upon the symptomatology.

The following examples of the cerebral pathology in some infections, were prepared by Dr. E. L. Robinson, of the Pathological department, Toronto General Hospital.

PLATE 1.—From a case of general infection beginning with an anthrax pustule on the face. Signs of a general infection—fever—then absolute unconsciousness. Large sub-arachnoid hemorrhage over whole of cerebrum, myriads of punctate hemorrhages. (From a case in the service of Dr. H. A. Bruce).

PLATE 2.—Severe malarial infection. Patient in coma with fixed pupils; multiple emboli of parasites and pigment-containing cells in the minute vessels of the brain. (Specimen lent by Prof. W. G. Macallum of Baltimore).

PLATE 3.—Case supposed to be an alcoholic; restless and irrational for weeks; marked hyperaethesia, fatal coma; extensive endocarditis of mitral and aortic valve due to staphylococcus aureus infection; embolus of the left middle cerebral artery, sub-arachnoid hemorrhages, thrombus of right lateral sinus, multiple areas of minute pyemic encephalitis. (Service of Professor Duncan Graham).

PLATE 4.—Case of headache, asphasia, staggering gait for some days, then sudden hemiplegia of right side, unconsciousness: profuse mitral and aortic endocarditis, extensive sub-arachnoid hemorrhages, multiple minute hemorrhages in brain with no sign of reaction. (Service of Professor Duncan Graham).

PLATE 5.—Case of fever, weakness and paresis, and finally paralysis of all extremities and muscles, considered as encephalitis. At autopsy, endocarditis, multiple minute thrombi throughout brain. (Service of Professor Duncan Graham).

ANAESTHESIA AND ANAESTHETICS

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PERHAPS in no department of medicine is there greater need of co-operation and mutual reliance than between surgeon and anaesthetist. Nothing can be more trying to the surgeon than to be uneasy in his mind, or actually interrupted in his work over questions relating to the anaesthetic. On the other hand, an anaesthetist who feels that he enjoys the surgeon's trust is in a happy position to devote his entire attention to his own duties and responsibilities, which, while they are usually light as compared with those of the surgeon, are none the less real to the anaesthetist. A discussion of some of the points upon which the interests of surgeon and anaesthetist meet, should, I feel sure, be of mutual benefit.

Not a great while ago the opinion was expressed that local anaesthetists do not use chloroform frequently enough. Chloroform has usually been regarded as more dangerous than ether, on this continent, and its chief advocates appear to have been in Britain. That there is some heart-searching going on there, the literature of the last two or three years would seem to indicate. Last year Levy[1] published a monograph on chloroform anaesthesia, which defines very clearly the present status of this drug. Levy says: "The ventricles of the mammalian heart are in an irritable condition when affected by chloroform. This irritability is most marked when they are lightly affected by chloroform, and is progressively diminished under conditions of deepening anaesthesia. When thus made irritable, extra systoles of ventricular origin are easily evoked by (1) conditions which stimulate the ventricles, (2) conditions which remove or reduce depressing influences, and are thus the equivalent of a stimulation." Bearing in mind that the vagus is depressor in action and that the cardiac sympathetic fibres are pressor or accelerator, let us consider the effect during light chloroform anaesthesia, that is with already irritable ventricles, of the action of such a substance as adrenalin. Adrenalin stimulates the myoneural junctions of the cardiac sympathetic fibres. In the cat, under light chloroform anaesthesia, 1 minim of 1-1000 solution of adrenalin injected intravenously, produces an intense ventricular tachycardia, which almost always terminates in ventricular fibrillation. While the human heart is probably not quite so susceptible, there is a case on record where the injection in the nose of adrenalin for a nasal operation during chloroform anaesthesia, produced fatal ventricular fibrillation. Apart from the exhibition of adrenalin therapeutically, it is well to remember that emotions and strong sensory stimuli, such as may occur during an operation, result in an outpouring of adrenalin into the circulation.

Another point: most of our patients have received a preliminary injection of morphia and atropine when they reach the operating room. So far as morphia goes, it depresses the respiratory centre, and tends to induce cyanosis under chloroform. Atropine depresses vagus action. The vagus diminishes the irritability of the ventricles. If vagal tone be abolished, the ventricles are more ready to pass into an irregular tachycardia and subsequently to fibrillate. Consequently the use of chloroform after atropine carries with it an additional risk.

The danger of ventricular fibrillation is slight, it is true, under full chloroform anaesthesia, and clinical experience confirms this, but no way has yet been devised of obtaining that degree of anaesthesia without the genuine dangers present during induction and recovery. The points which Levy emphasizes are: 1.—The condition is more prone to occur during light anaesthesia, hence during induction, recovery, and under C.E. and A.C.E. mixtures. 2.—That strong sensory stimuli may precipitate it. This includes operative procedures, the reapplication of chloroform after administration has ceased, and recovery commenced. 3.—The injection of adrenalin.

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It must be remembered that this is not chloroform overdosage. An overdose depresses the respiratory centre and induces asphyxia, and, as a rule, the heart continues to beat vigourously for some time under this condition. Withdrawal of the anaesthetic and artificial respiration will result in recovery. In ventricular fibrillation, the circulation is arrested, the blood pressure drops immediately, and death comes at a stride. I am sure that some present have seen, as I have, this phenomenon. A few drops of chloroform, fifteen or twenty minims, to a patient who has scarcely lost consciousness, a rapid irregular pulse, a blanching of the face, and respiratory failure that defies all efforts to re-establish it.

We used to think that by combining ether and chloroform, the desirable features of each were retained, while the undesirable effects were more or less mutually counteracted. In the light of Levy's work, such mixtures are even more dangerous than pure chloroform. The mortality figures given by Levy tend to confirm this, since while the total deaths remain fairly constant, those from C.E. have increased. The same objections can be raised to an induction under chloroform, followed by ether.

Gentlemen, I am convinced that chloroform has had its day, and that like the sawdust and the carbolic spray, it should be relegated, not without honour, to the past of surgical history.

There are a number of conditions occasionally requiring major operations, in which the choice of an anaesthetic is important.

Pulmonary tuberculosis.—Let me say definitely that inhalation anaesthetics will almost always aggravate a pulmonary lesion and may convert a favourable case into an unmanageable one. Occasionally patients with *glycosuria* require operation. In the first place patients with diabetes mellitus do not stand inhalation anaesthetics well. Certainly before any operation is undertaken an attempt should be made to determine whether or not the case is true diabetes, and, if so, to get the patient sugar free. This seems so obvious that one would hesitate to make such an observation if experience did not show there is room for it. If the case is diabetes mellitus, ether and chloroform are more likely than not to induce coma. Gas and local offer the best hope.

We do not make a practice of giving routine preliminary medication to children, although we see every day the benefit in adults, and it is not at all unusual to have a child cyanosed from a large quantity of mucus secreted. *Atropine* is well borne by children, even as young as two years, and the benefit is believed to offset the distress occasioned by giving a hypodermic injection to a little one.

In some classes of cases the giving of *saline interstitially* has become practically a routine, notably in goitre operations, and we have remarkably little trouble. Nevertheless I believe we could and should use the rectal route more frequently, particularly in asthenic patients.

Cases occur from time to time in which vomiting is present—cases of intestinal obstruction, acute appendicitis, and so on. These cases should have a stomach tube passed before being anaesthetized. The danger of death by asphyxia from aspiration of vomitus is always present, and aspirated vomitus invariably sets up a very grave broncho-pneumonia. I do not believe it should be left to the anaesthetist to carry out stomach lavage in these cases.

Ether oil per rectum has proved very useful in cases where, for various reasons, the ordinary methods are not available. In these cases it is essential that the bowel be well prepared beforehand, and when this has been done there are no unpleasant sequelae.

One hears from time to time of ether pneumonia. I have thought it worth while to review the literature bearing upon this condition, and to examine the records in the General Hospital.

Whipple[2] reports a study of post-operative pneumonitis in the Presbyterian Hospital, New York. During 1915-16, in 3719 patients operated upon, 97 cases of pneumonitis occurred. As an aid in diagnosis, free use was made of the x-ray, and this frequently showed areas of consolidation some time before physical signs were present. As etiological factors he lists: 1.—Local inflammation in the upper respiratory tract. 2.—Vasomotor changes causing a congestion of the pulmonary vessels. 3.—Factors inhibiting the normal thoracic and abdominal respiratory movements. 4.—Local or general infections elsewhere than in the respiratory tract. 5.—Debilitated states. 6.—

Factors increasing the virulence of the inciting organisms. He emphasizes the fact that a hospital nightshirt and hospital bedclothes are frequently much lighter than the patient is accustomed to. A hospital blanket sometimes will not cover feet and shoulders simultaneously. Further, the temperature and ventilation, while excellent, often differ radically from the conditions under which the patient is accustomed to sleep. Cold draughty corridors may play a part during the patient's trip to and from the operating room.

Decker of Pittsburg[3] states that one case in forty-five operated upon developed some respiratory tract lesion, and that one in two hundred dies. He regards pneumonia as by far the most frequent lesion, amounting to 75% of the complications. He distinguishes between cases arising in the first 48 hours, and those developing later, regarding the first class as much the more serious.

W. J. Mayo in a foreword to Labat's textbook on regional anaesthesia states that apart from exudative conditions pre-existing in the respiratory tract, there is reason to believe that many post-operative pneumonias are embolic in origin.

The records of the Vancouver General Hospital show that during 1922 there were 4,528 major surgical and gynaecological operations upon approximately 2,800 patients. These patients are seen post-operatively by the Assistant Superintendent at intervals during their stay in hospital, and it is from his notes on any complications developing after anaesthesia that I have been able to arrive at the following figures.

Twenty-eight cases developed clinical evidence of broncho-pneumonia or lobar-pneumonia post-operatively. Of these, five cases developed symptoms from nine to sixteen days after the operation, the attack being ushered in by headache, chills, coryza, etc. They appeared in every way to have been due to an infection of an influenza character and did not appear referable to the operation or the anaesthetic.

Of the remaining twenty-three cases, the ages ranged from 6 years to 56 years, the majority being people of 30 to 40 years. Four cases occurred in January, 1 in February, August and September, two in March, November and December, while ten occurred in October.

In thirteen cases the routine physical examination showed no evidence of any trouble; in two cases cough only was present; in seven cases there was evidence of a respiratory lesion and in one case no note was made. The operations followed by trouble were as follows:—hernia, five cases; gastro-enterostomy, three cases; gall-bladder, three cases; appendectomy, three cases; perineal repair and laparotomy, three cases; and 1 each of the following: salpingectomy, epididymotomy, nerve-suture, Caesarean section and prostatectomy. The onset of symptoms was in three cases immediate; in six cases, twelve hours; in four cases, twenty-four hours; in eight cases, forty-eight hours, and in one case, three days. The duration was in sixteen cases, four to eight days; in two cases, less than four days; in four cases, one to two weeks; in one case, a month. In two cases the condition contributed materially towards a fatal outcome. In one of these there was no evidence pre-operatively of a chest condition; in the other, cough and expectoration, without physical signs, were present. The anaesthetics employed were:—ether, seventeen cases; chloroform, one case; C.E., three cases; gas and ether, one case; local, one case. The fact that nearly half the cases occurred during one month, at a season when respiratory ailments are common speaks for itself.

While a comprehensive study of these cases is not possible, one is justified, I think, in drawing some conclusions. First, that the incidence is mainly seasonal. Second, that the anaesthetic agent is not the principal factor. Third, that evidence of an inflammatory process in the respiratory tract should contra-indicate any elective operations. Fourth, that a routine physical examination is of real value.

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POST-OPERATIVE TETANUS

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TETANUS is probably the most ruinous complication which can follow any surgical procedure, not only because of the high percentage of mortality, but on account of its cruel method of bringing about death, usually in from one to four days. Two of the Hippocratic aphorisms express tersely the general prognosis even at the present day. "The spasm supervening on a wound is fatal" and "Such persons as are seized with tetanus die within four days, or, if they pass these, they recover."

While the prognosis given in the above aphorisms may have improved since the use of tetanus antitoxin in the treatment of open wounds, tetanus following operative or closed wounds is fatal in more than 75% of the cases, and while it is impossible to prove definitely the source of post-operative tetanus in all instances, yet statistics of reported cases point to one common source—the suture material; but these must be considered in conjunction with the bacteriology, pathology, surgical technique, and the nature and preparation of the suture material.

I wish to divide this paper into three parts; the first, an historical review; the second, the suture material; the third, the experimental work which we have carried out.

Historical Review

The bacillus of tetanus occurs in nature as a common inhabitant of the soil, being abundant in many localities—not only in the superficial layers of the earth but also at a depth of several feet. Writers mention various places where it has been found, such as dust in houses, streets, gardens, in hay, manure, and the excreta of animals. It has been found, according to one writer, at the bottom of mountain lakes in Switzerland, in the draggings of the Dead Sea, and in the arrow poison of certain savages in the New Hebrides, who obtained it by means of smearing their arrow heads with dirt from crab holes in the swamps. It is an anaerobic, moderately motile bacillus, forms spores, and in the spore stage is not motile. It grows best at a temperature of 38°C, when, within 24 hours, it forms spores. It will not, in pure culture, grow in the presence of oxygen, but with certain other bacteria the tetanus bacillus grows luxuriantly even when oxygen is present. The spores of the tetanus bacillus are very resistant to outside influences; in a dessicated condition they may retain their vitality for several years and are not destroyed in 2½ months when present in putrefying material. Sir William Osler[12] writes of an experiment that was carried out, when from steel nibs dipped in tetanus culture in 1891 a growth of virulent bacilli was obtained, from one in 1902 and from the other in 1909—eighteen years later. Parke & Williams[13] report that Henrijean, who by means of a splinter of wood which had caused tetanus, was able after eleven years to produce the disease by inoculating an animal with the same splinter.

Pathogenesis.—In mice, guinea pigs, rabbits, horses, goats, and some other animals, inoculation of pure cultures of tetanus bacilli causes typical tetanus after an incubation of from two to three days. Rats and birds are but little susceptible, and fowls scarcely at all. Man is more susceptible than any of the other animals so far tested.

It is a remarkable fact that an amount of tetanus toxin sufficient to kill a hen would suffice to kill 500 horses. On the inoculation of less than a fatal dose in test animals, a local tetanus may be produced which lasts for days and weeks and then ends in recovery. On killing the animal, there is found at autopsy, just at the point of inoculation, a haemorrhagic spot, and no changes in any other organs. A few tetanus bacilli may be detected locally with great difficulty, often not at all. Possibly a few may be found in the region of the neighbouring lymphatic glands. From this scanty occurrence of bacilli, the conclusion has been reached that the bacillus of tetanus, when inoculated in pure culture, does not multiply to any great extent in the living body, but only produces a lesion through the absorption of the poison which it develops at the point of infection. It has been found that pure cultures of tetanus, after the germs have sporulated and the toxins been destroyed by heat, can be injected into animals without producing tetanus; but if a culture of non-pathogenic organisms is injected simultaneously with the spores, or, if there is an effusion of blood at the point of injection, or if there were a previous bruising of the tissue, the animals surely die of tetanus. Even irritating foreign bodies have been introduced with the spores deprived of their toxins, and tetanus did not develop, but if the wound containing the foreign bodies became infected with other bacteria, tetanus developed and the animals died. From such experiments it seems that a mixed infection aids greatly in the development of tetanus, when infection is produced by spores not accompanied by tetanus toxin.

Tetanus in man.—Although rather deep wounds are usually the seat of infection, at times superficial wounds, as an acne pustule, or a vaccination, may give the occasion for the infection. It should be borne in mind that, where there is no external or visible wound, there may be an internal one, yet I fail to find in the literature any instance of tetanus occurring in typhoid fever, where one would expect to see it as a complication, if intestinal infection is to be considered. Sir William Osler[12] enumerating the complications of typhoid fever says "true tetany occurs sometimes and has been reported in connection with certain epidemics," but he does not mention one single instance of tetanus occurring in typhoid fever.

Toxin of tetanus bacilli.—It is evident from the localization of tetanus bacilli at the point of inoculation, and their slight multiplication at this point, that they exert their action through the production of powerful toxins. Sir William Osler[12] states that tetanus toxin is possibly the most virulent of known poisons. The lethal dose of cobra venom in comparison requires 4.375 m.g., strychnine 30-100 m.g., anhydrous prussic acid 54 m.g., tetanus toxin 0.23 m.g. to a man of 70 kilos weight. At this rate, one grain of tetanus toxin is fatal to 281 people. Browning[4] states that the horse and human are equal in susceptibility, and that a subcutaneous injection of concentrated toxin of 0.003 cc. is fatal to a horse. Muir & Ritchie[11] state "the enormous potency of such a poison explains how, even in a fatal case, extreme smallness of the wound and difficulty in isolating the bacillus, do not detract from the theory that the latter is the cause of the disease. Dieulafoy[6] states "the toxin does not spread through the blood stream. The intravenous injection of tetanus toxin must be 8 to 10 times as strong as the subcutaneous injection in order to produce death, because the poison travels almost exclusively along the nerves to fix itself in the cells of the spinal cord or in the bulb."

Rapidity of absorption of tetanus toxin.—After the absorption of the poison there is a lapse of time before the effects are noticed. With an enormous amount, in about 12 hours—with ten fatal doses, 36-38 hours—with two fatal doses, 2-3 days. Less than a fatal dose will produce local symptoms. If a minute quantity of tetanus toxin is injected into the end of a rat's tail, and the tail is amputated 45 minutes after, the amputation will not save the animal. One experimenter accidentally pricked himself in the hand with a hypodermic needle which was simply moistened with toxin, and in three days developed all the symptoms of the disease.

The following remarks of Dr. Vaillard[21] although they may in some respects repeat statements already made in this paper, are quoted verbatim in order to emphasize some important features.

> "Tetanus, common to man and domesticated animals, was formerly a very wide-spread disease. In surgery tetanus claimed daily a large tribute from those operated on. I will only quote examples taken from your medical literature. Lynd reports that in India, out of six cases of amputation, five died owing to this complication. Wallace in 1882 stated in *The Lancet* that out of 2148 important operations carried out at the Calcutta Hospital, 43 died of tetanus, *i.e.* 2%. According to Keely *Annals of Surgery*, 1888, during the years preceding 1881, the tetanus mortality was so extraordinary at the West London Hospital after operations or complicated fractures, that the hospital medical council had to take steps to arrest such a scourge. The bacillus never spreads itself in the infected organism; it localizes itself exclusively at the seat of the wound, in the pus which forms there, in the superficial layer of the purulent pocket, and develops only there. It is therefore alone in the wound, sometimes very insignificant, that the microbe creates the poison and which, reaching the central nervous system by the blood and nerves, causes the symptoms of tetanus. It can also be said that amongst all poisons known, microbian and other-

wise, there is none than can be compared with it. The spores of the tetanus, as we know, are extensively disseminated around us. On the other hand, the circumstances under which they can be brought into contact with injured tissues are numerous, and yet, in spite of these eventualities which it seems must increase the chances of infection, tetanus remains a rare disease for all this.

''The reason is, as has been established by a multitude of researches, that the penetration of the tetanus bacillus in a wound does not always conclude the etiology of the disease and does not suffice *ipso facto* to cause its outbreak. In addition to this, certain conditions are necessary before the disease asserts itself; and it is because they must be simultaneous with several factors, that tetanus is of rare occurrence. I must therefore summarily state the principal facts on which this pathogenic conception of the disease is based. The first point is fundamental: The tetanus spores taken from a culture and freed from the toxin which they have created, are harmless when they are injected by thousands, and even by millions into the healthy tissues of an animal, provided they are in a pure state.''

This last statement is corroborated by the Medical Research Council (National Health Insurance) of England, by Sir D. Semple[18] *et al.*

''These spores, deprived of any pre-existing toxin, do not grow and do not cause the disease, because as soon as they are introduced into the system they are taken into and rendered immobile and then destroyed by the phagocyte cells. As proof of this, the same spores introduced in infinitesimal quantities in the same tissues grow very well and cause tetanus when they are artificially protected against the phagocytes. The following experiment will show this:—the guinea pig resists a subcutaneous or intraperitoneal inoculation of a number of germs estimated at more than two millions for certain experiments; but it will certainly die of tetanus if it is inoculated with a few isolated spores mixed with very fine sand which is enclosed in a small, well-closed piece of Berselius paper, thus forming a sufficient barrier between the microbes and the phagocytes. The latter do not reach the spores as they are prevented by the thin layer of paper. The spores grow and become bacilli; the latter secrete their toxin which easily diffuses through the paper membrane and causes tetanus. Consequently is one not led to think that the spores introduced into a wound with particles of dirt can only infect man or animals if the circumstances permit them to escape from the destructive activity of the leucocyte cells?

''I mentioned above that an animal can be injected with impunity with a considerable number, sometimes millions of tetanus spores, pure and deprived of toxin. A like innocuity contrasts strangely with the fact that the animals die of tetanus when they are inoculated subcutaneously with a few milligrams of earth, although the number of germs contained in it is extremely small and probably not more than a few units. On the other hand, human tetanus comes on in circumstances where the wound could not have been contaminated by a quantity of tetanus spores equal to the number which small animals easily tolerate. We must therefore admit that in every case where the disease comes on after experimental or accidental infection of a wound by the soil or other virulent product, the spores receive help of some sort which has enabled them to grow. The pathogeny of tetanus in natural infection appears then to be a complex phenomenon which, in order to take place, has to have the simultaneous help of several factors; the specific germ, and favorable conditions for its growth, the latter acting either to diminish or destroy the cellular defence of the organism. There are abundant proofs of this, as experiments have enabled us to discover these auxiliary agents and the part they play. It especially shows the rôle of the nature of traumatism and even more the part of the microbian symbiosis. In animals very sensitive to tetanus, such as the guinea pig, if we reproduce various kinds of trauma, then inoculate the tissues thus injured with pure spores and without toxin, taking care to eliminate all other factors except the traumatism itself, it is found that the simple injuries, superficial, regular and aseptic, do not constitute favourable circumstances for the growth of the spores, and the production of tetanus. If, in the natural conditions of infection, tetanus comes on in such a case, either in man or in domesticated animals, assuredly a factor other than traumatism has intervened. The same thing does not happen when the tetanus spores are introduced into tissues mortified by burning or crushing, in contused and anfractuous, convoluted or sinuous wounds, or in a haemorrhage, and especially at the centre of a subcutaneous fracture between the fragments of bones; such conditions are eminently favourable to the growth of spores which then germinate without any other help. It must be remarked that in traumatisms of this nature, the leucocytes are very rare at the centre of injury, at least during a certain time. These results are in agreement with observations which have been made; tetanus rarely comes on as a result of superficial wounds, clean and regular and kept free from dirt; it complicates, by preference, burns either deep or of an extensive nature, injuries caused by crushing, where the tissues are deeply bruised and infiltrated with blood, and compound fractures. The microbian association (by which I mean the simultaneous intervention in a wound of the tetanus bacillus and different kinds of bacteria) plays an important part in the mechanism of infection. It is more often because certain microbes are introduced into a wound at the same time as the tetanus spores, that the latter can germinate, secrete the poison and produce intoxication. If a wound is contaminated with tetanus spores, but at the same time no bacteria favourable to their germination gain access, no tetanus will result; this is the reason why tetanus is rare in spite of its enormous dispersion. This rôle of microbian association in the pathogeny of tetanus conveys an idea, the appreciation of which is important in practical work.''

We are not making any attempt to collect all post-operative cases mentioned in the literature, as it would be of little benefit, besides there are numerous references to foreign journals which are not available.

A summary of the findings in reported cases will show (1st) that tetanus has complicated operations of various kinds; (2nd) that details are lacking as to the suture material employed in many cases; (3rd) that P.M. findings are singularly inconclusive. The possible sources of post-operative tetanus are:— 1st—That the wound is infected from the air at the time of operation; 2nd—Infection from instruments or gauze used at time of operation; 3rd—Infection from the intestine; 4th—Infection by suture material. Considering the first—it seems a rare possibility, and if at all likely one would expect it during the summer season when dust is more common, but we find it is not a seasonable condition. As stated, experiments go to prove that the tetanus spores, in which condition they would exist in dust, do not grow without protection against the leucocytes unless accompanied by other germs aiding growth by symbiosis. The incubation period is also against such a mode of infection, when it is recognized that experimental, direct inoculation, under favourable conditions, shows an incubation period of 3-4 days, whereas the majority of cases following operation have an incubation period averaging 10-12 days. A search of the literature does not reveal any instance of a submucous resection of the nasal septum being complicated by tetanus.

These same arguments are equally applicable to the second possibility of infection by instruments or gauze.

3rd—Infection from the intestine. Recorded cases of post-operative tetanus are found in only a small percentage of cases where the operation was done on the alimentary tract. In addition, if the infection took place from the bowel, it is difficult to conceive that only the tetanus bacilli would be liberated and, if a mixed infection occurred, the incubation period, as shown above, would be 2-4 days instead of the average 10-12 days.

4th—Infection by suture material. There are many points in favour of this being the actual source. We have the definite statements of the tetanus bacillus having been found in catgut. Koch inoculated mice with catgut and produced the disease. The Clinical Research Association cultivated a bacillus having the characteristics of the tetanus bacillus from catgut similar to that used in the fatal cases recorded by Jaffe[9]. In Richardson's series catgut was examined in fourteen cases and organisms resembling tetanus bacilli were found in five. Few, if any, will doubt the possibility of raw catgut being contaminated, taken as it is from sheep's intestines, under varied methods of cleansing and scraping. What other substance could be conceived of where such ideal conditions exist for the protection and subsequent inoculation as in catgut? Bacteriologists state that the tetanus bacilli, under adverse conditions as to their growth, pass into the spore stage in a time estimated at 24 hours or less, and remain indefinitely in this stage until revived under conditions suitable to their growth and activity. So far as known, age is no barrier to this property in the tetanus spore. Infected areas in the flat, untwisted sheep's intestine being granted, we can easily see that twisting is nothing more or less than close wrapping of the bacilli, which in turn pass to the spore stage, and await dehydration, adding to their protection and preservation from destruction, by either heat or chemical sterilization. The further preparation of catgut in making the larger sizes, when a number of strips of twisted intestine are used, gives a further protection, and the added treatment of chromicizing, tanning, or other hardening process, has the same effect.

For the sake of argument let us grant that catgut is the source of infection, and follow the results we know to have occurred. In spite of the fact that post-operative tetanus is a rare complication compared with the number of operations done, many factors enter to explain this rarity. First—We would hardly expect that all material used in the making of catgut was infected, or that all sheep were. It is said by one firm of manufacturers of catgut that only 10% of range sheep are infected with tetanus, and the initial cleaning, be it never so crude, might wash away the bacilli, or that only a small piece of mucosa might be left by insufficient scraping. Second—We have the report of investigators—Butterfield & Ely[5] who state that when catgut is sterilized at a less pressure than 28-30 lbs, a contaminated catgut was found and the larger the size and chromicizing, added relatively to this contamination. Third—It is not to be expected that infection in a strand of catgut would be continuous throughout its whole length, and a conservative estimate of the use of a strand of prepared catgut by any surgeon, in any operation, shows only one-half or three-quarters of any strand being used. These three groups of reasons allow, therefore, for the rarity of the complication. Statistics show that in operations where a great deal of catgut is used, or where large and chromicized strands are employed, the greatest percentage of the dreaded complication occurs. Is this in itself not significant? Following the idea a little further, we explain several important features. First, the infection arising as a pure tetanus focus, not in association with other bacteria. Is not a focus of tetanus infection in a strand of catgut fulfilling to the letter the experiments quoted by

Vaillard in which he states that a few spores of tetanus may be fatal when such spores are protected from the phagocytes of the blood until they have produced sufficient toxin to prepare their way, and is not the catgut a semipermeable membrane, similar to the Berselius paper used in his experiment, allowing the body fluids to penetrate the catgut and supply ideal culture media to the spore, and, in turn, the toxin to diffuse outward? Second—This explains the delayed incubation period, being the time necessary to soften the hardened catgut and create activity of the spores. Third—It also explains the insignificance of the pathology found after a fatal termination, where such deadly poison has been taken up by the nervous system. Fourth—Also the difficulty of finding the tetanus bacilli after death.

Suture Material may be roughly classed into absorbable and non-absorbable. With the latter we are not concerned in this paper. Of the former catgut and kangaroo tendon are the principal materials used. This paper will be confined to the subject of catgut only. Catgut of to-day is made from the small intestine of lambs. It consists anatomically of the submucous layer, histologically connective tissue; chemically it is principally collagen with a certain amount of body salts. The origin of the use of catgut can only be surmised. The antiquity of the stringed instrument is shown by a picture of a harp in the tomb of Gyzeh of the date 4975 B.C. In the reign of Rameses III. of the 12th dynasty, 1250—1284 B.C., the stringed instrument represented by the harp reached the height of its vogue in Egyptian history, described as the most beautiful instrument ever made, inlaid with gold and silver, and carved in figures of gods, goddesses, etc. The strings of nearly all the Egyptian harps were made from the intestines of camels. Musical instrument strings made from the intestines of wolves were said to give forth harsh sounds. We do not know why the material was called catgut; as writers say, it is not likely cats' intestines were used by the Egyptians as they considered the cat a sacrd animal. Marcy states that in the Odyssey the strings of the old Greek harp are described as made from the twisted intestines of sheep. Vesalius in the 16th century mentioned the ligature as a relic of the past. We can easily imagine the difficulty surgeons would be confronted with in using catgut as suture material before the days of antiseptic surgery. To Lord Lister we must give the credit for placing it on a firm basis as a useful, absorbable ligature. The properties that he sought to establish or standardize in catgut were: (1) that it should be sterile; (2) that it should be sufficiently strong for the purpose for which it was to be used; (3) that it should not be absorbed either too soon or too late. Lord Lister treated catgut with corrosive sublimate to render it sterile, and decided upon sulphate of chromium to render it sufficiently slow in absorption to suit the needs of the case. His experiments with microscopical findings of sutures, used and partially absorbed, make interesting reading. They are to be found in "*The Collected Papers of Joseph Baron Lister.*"

The process of manufacturing strands of catgut does not require description in this paper, excepting to draw attention to the fact that only the outer or peritoneal half of the intestinal tube is utilized in making surgical catgut, the inner or mesenteric half being employed for tennis racquet material, etc. A number of the half tubes of intestines are necessary in making any but No. 000 or the finest strand of catgut, which requires but one strip, or half one intestinal tube. It is said that most of the firms selling or manufacturing catgut in Canada and the U.S. buy the raw material in strands already twisted and numbered. European countries have in the past been the main source of supply. Catgut may be surgically classed in two main varieties, *i.e.* plain and hardened, treatment of the latter being similar to the tanning of leather, various chemicals being employed to bring about this property. While certain solutions used in makink plain catgut, or further treatment by chromicizing, may assist in killing bacteria present, they are mainly surface sterilization, as practically all manufacturers of suture material depend upon heat as the ideal method of rendering catgut sterile. It is self-evident that animal tissue cannot be heated sufficiently to kill bacteria and preserve the substance unless all fat and moisture have first been removed. To dissolve out the former, ether is frequently used. Let us analyse this step: catgut is not soluble in ether, and a simple experiment will prove this. Add a little Sudan 3 stain to some pure ether, filter it and place some catgut strands in the solution. It will be noticed that the catgut does not swell, but remains of the same calibre for some weeks at least. Also on cutting the strands so immersed there is no indication that the stain has penetrated the substance, but it may be found slightly on the surface and between the fibres.

The next step, or dehydration of the material, is of great importance in the manufacture of catgut. When bought in foreign countries it may contain a little moisture when it reaches the manufacturer, and who can say what effect this gradual dehydration may have in rendering the spores of tetanus more resistant to heat than by a rapid dehydration? Hiss & Zinsser[7] quote Ficker "The resistance of bacteria to dessication is influenced by the age of the culture investigated, the rapidity with which the withdrawal of moisture is accomplished, and the temperature at which the process takes place. The spore forms of bacteria are infinitely more resistant to this influence than are the vegetative forms, though they may be destroyed by rapid or complete drying in a dessicator."

Sterilization, then, properly follows dehydration, and is carried out either by heating or, as called by some, boiling in cumol, alcohol, etc. and later tubing it; or tubing it first and then applying the heat, as adopted by manufacturers. Here we must recognize that catgut is not soluble in chemicals such as ether, chloroform, alcohol, toluol, cumol, glycerine or petrolatum, and, as pointed out by one writer, Thos. A. Berryhill[3] "It must never be lost sight of that when heated in a waterfree fluid, the character of sterilization is that of dry heat only, and requires the same degree of heat for effective sterilization as is needed in dry heat sterilization, without a fluid." Dr. Berryhill further states "That preparing catgut by boiling in cumol, is the best method as it not only allows a high degree of heat to be used, but it also deprives the gut of the fats and waxes." It must be admitted, it is true, that a high degree of heat may thus be applied, but it might well be questioned if catgut can be deprived of its fats and waxes by such treatment, since cumol does not penetrate the strands. Catgut sterilized by heat is dry sterilization when heated in any chemical that is not a solvent to the substance. The thermal death-point of tetanus spores must next be considered. For some reason the general impression is that 150° C. is sufficient to kill spores, but so far as the writer can find in searching works on bacteriology, moist heat is always referred to when the above temperature is given. To quote Butterfield & Ely[5] "As far as the writers know, no work has been done to establish the resistance of bacterial life to heat, when the forms of such life are completely dry, under oil, and protected from the effects of live steam." Hiss & Zinsser[7] may be quoted here. "It is thus clear that bacteria exposed to hot air may be considerably dehydrated before the temperature rises sufficiently to cause death by coagulation, complete dehydration necessitating their destruction possibly by actual burning. The same principle as herewith pointed out probably explains the great resistance to heat observed in the case of the highly concentrated protoplasms of spores."

Some manufacturers lay stress upon fractional sterilization in rendering catgut bacteria-free. This method described by Hiss & Zinsser[7] consists in heating the substance to be sterilized to 100° C. for a period of ¼ to ½ an hour on three succeeding days, incubating in the intervals at 37.5° C. to change spores into the vegetative or bacillary forms, bringing about their destruction at a lower temperature. "It is only applicable in cases in which the substance to be sterilized is a favorable medium for bacterial growth, in which it is likely that spores will develop into vegetative forms. Exceptionally, the method may fail even in favorable media, when anaerobic bacteria are present." What are we to say to this method being used when the solutions in which catgut is tubed are neither suitable to the growth of bacteria, or solvent to the substance they are attempting to sterilize? Taking next the reports given out by bacteriologists or laboratories, some of which appear in dozen tube packages of catgut, that samples say No. 0 and No. 2 plain, No. 1 and No. 3 chromic catgut "were incubated 96 hours and found sterile" no difference being mentioned as to the time of incubating the plain or chromic strands, when surgically speaking the latter may be hardened to withstand the body tissues 15, 20 or 30 days. Recent laboratory findings suggest that insofar as catgut and tetanus spores are concerned, unless the catgut is first macerated, incubation in vitro is unreliable.

Following the death from tetanus of a patient operated upon by the writer, all available literature bearing upon the subject of post-operative tetanus was read in the hope that some experimental work might substantiate or disprove the idea that catgut was the etiological factor in the causation of this dreaded complication. Bacteriological and pathological findings of reported post-operative cases were singularly inconclusive, and this was so in my own case, although many swabs were taken and tissue excised and subjected to microscopic examination. Unfortunately, no animal inoculation was carried out, although a focus was found similar to tetanus foci described in the literature. Its location was relatively about the upper quarter of the right rectus incision and had as its base the rectus muscle, fat tissue as its walls and coverings. That portion of the No. 2 chromic catgut used to suture the rectus sheath was free in the centre of the necrotic focus. and was sterile so far as examination was carried out. Only part of this loose catgut was removed. The examination did go to prove that the focus described was sterile to any growth of bacteria, proving it was not an abscess, which we also confirmed by its appearance, lack of symptoms, etc. The findings in this case, evidence quoted by others, and my own findings in experimental work, lead me to infer that catgut is most likely the etiological factor in post-operative tetanus and that *the tetanus bacilli may not be liberated from the suture at the time of the patient's death.*

Experimental work.—Situated so far away from any catgut manufacturing plant and the necessity of procuring material to experiment with, led the way to an abattoir, where it was found that sausage-casing manufacture in many respects was similar to the preparation of suture material, and arrangements were made to secure what was required, giving it the added cleaning necessary. The strips of split intestine or its sub-mucous layer, were cut into suitable lengths, inoculated with a bouillon culture of tetanus, twisted into a cord, dried, chromicized, dehydrated, cut into pieces 1 to 2 inches in length. These were put in small bottles, again heated and sterilized, each bottle at a different temperature, except one bottle which was used to test what effect chromicizing would have. Guinea pigs were used as test animals in all cases and control cultures given to the laboratory.

A summary of my experimental work to date goes to prove that the implantation of tetanus-infected catgut into guinea pigs will cause their death with an incubation period similar to that found in post-operative cases and that the laboratory incubation of other pieces of the same catgut will not show any growth in the same time. Also that the necrotic material found surrounding the piece of catgut removed from an animal after a tetanic death will not transmit the disease when injected into another test animal, but the tetanus bacilli may be recovered from the piece of catgut which brought about the death of the test animal Further experimental work is being carried out.

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QUINIDINE SULPHATE IN AURICULAR FIBRILLATION*

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As far back as seventy years ago, quinine was recommended in the treatment of heart disease, and was considered especially valuable in patients suffering from palpitation and tachycardia.

In 1914, Wenckebach[1] reported his discovery of the occasional action of quinine in restoring the normal rhythm of the heart in auricular fibrillation. This report appeared to create no further interest until 1918, when Frey[2] investigated the action of the various cinchona derivatives. Frey found that quinidine yielded by far the most striking results in fibrillation and flutter, and that quinidine sulphate, being more readily absorbed, was of more value than the pure alkaloid. About eighteen months ago, Lewis[3] and his co-workers published the results of their investigation regarding the nature of auricular flutter and auricular fibrillation. Briefly, their conclusions were that the onset of fibrillation is due to a circus movement becoming established at some point in the auricle, frequently about the mouth of the superior vena cava, the sinus initiation for the stimulation of auricular contraction of course disappearing at this time. This contracting circle of muscle, in which the new wave travels, persists so long as the abnormal rhythm continues. Lewis points out that in the maintenance of the abnormal rhythm three factors are involved; (1) the length of the central path; (2) the rate at which the wave travels; (3) the duration of the refractory period. These three factors must be in such relation to each other, that the circulating wave of excitation, as it advances, must always find just ahead of it, muscle which has had a sufficient period of rest to restore its excitability following the refractory state, and ready to respond to a stimulus for contraction. Now if in this circus movement any means could be discovered which would close the gap between the wake and advance of the circulating wave, fibrillation could be brought to an end. In other words, prolongation of the refractory period, or sufficient quickening in the rate of conduction in the circle, would terminate the fibrillation, for, when the wave now completes the circle, it will find the muscle still in the refractory period and no response can occur. In a certain proportion of cases of auricular fibrillation, quinidine is a drug which apparently produces this result.

It has been demonstrated that quinidine lengthens the refractory period, but at the same time slows conduction. The first effect would tend to abolish the circus movement. The second would widen the gap between successive waves, and so establish the circus movement more firmly. Thus, in the administration of quinidine, there would appear to be two opposing factors at work, and the result of treatment must depend upon which of these factors gains ascendency.

Since the appearance of Frey's paper in 1918, 461 cases treated with quinidine have been reported in the literature, the greater portion of these within the last year. In fifty-three per cent. of these the normal heart rhythm was restored. This does not mean that in the fifty-three per cent. fibrillation was permanently arrested, for doubtless in the majority, it has only been a temporary cessation.

Other than the case herein reported seven deaths have been recorded in the literature in patients treated with quinidine sulphate[4 5 6 7] In the case of four of these it is possible, even probable, that the administration of quinidine was a factor in producing death, though no certain proof of this has been shown. Five of the six had serious myocardial failure, and a fatal result might not have been unexpected with any method of treatment. Nevertheless, we do know that quinidine can cause alarming symptoms, and we should hesitate to state that it can not cause death. In patients suffering from auricular fibrillation, the majority of whom have some other discoverable cardiac lesion, sudden death is not so very infrequent, and six deaths out of a total of 461 cases under observation, would not be considered a high mortality in a similar number with any or no special treatment.

During the past eight months in the wards of the Toronto General Hospital, thirty-one patients suffering from auricular fibrillation have been treated with quinidine sulphate. In all but one patient, the diagnosis of fibrillation has been confirmed by electrocardiogram, and later rhythms have been proven in like manner.

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For the present report we have chosen the first twenty-eight cases treated. These form a fairly comprehensive group. The age ranges from twenty-seven to eighty years, the majority being under fifty years of age. The sexes have been almost equally divided.

At the time of commencing the quinidine sulphate, twenty out of the twenty-eight patients showed evidence of passive congestion of the lungs, or liver, or of both. All had limitation of cardiac reserve, the majority to quite a marked degree. A number of the patients treated had formerly been seen in the Out Patient Heart Clinic, and several of these had been under observation while their heart rhythm was normal. In these cases a definite date for the onset of the abnormal rhythm was ascertainable. In the remainder, a fairly certain date of onset could be fixed by the history of the occurrence of more acute symptoms of myocardial failure, *e.g.*, palpitation, increased shortness of breath, oedema, etc. Estimated thus, the duration of fibrillation of the auricles in the twenty-eight cases recorded ranged from three days to six years. All the cases showed some degree of heart muscle change

CHART No. 1

No.	Age	W't	Predisposing Cause	Duration of Fibrillation	Estimation of disability before Q.S.	Valvular Lesion	Size of Heart in cm.	Condition of Arteries	Ventricular Rate before Q.S.	Ventricular Rate after Q.S.	Systolic B.P.	Digitalis
1	65	118	art scler.	2 weeks	80%	M.I.	14	++	128	64	150	No
3	49		art. scler.	1 week	50%	M.I.	13.5	+	120	64	120	Yes
4	56	115	art. scler.	3 months	50%	none	14.2	+	140	84	140	Yes
6	50	135	none	1 year	35%	none	15.6	Normal	100	76	124	No
10	43	140	R.F. & V.D.S.	17 months	60%	M.S.	16	+	72	76	100	Yes
11	80	200	art. scler.	3 days	100%	none	—	+++	140	80	—	Yes
13	36	149	flu—2 yrs.	1 year	75%	none	14.7	Normal	84	64	120	No
16	27	137	tonsillitis flu & V.D.G.	9 months	50%	A.I., M.I. & M.S	13	Normal	60	60	105	No
17	55	123	art. scler.	10 days	75%	M.S.	13.3	+	116	84	118	Yes
18	58	116	none	2 years	75%	M.S.	18	Normal	84	76	122	Yes
19	62	—	R.F. & art. scler.	1 year	75%	M.S.	13.9	++	116	80	118	Yes
20	40	81	R.F., S.F., art. scler.	9 weeks	75%	M.S., M.I. A.S., A.I.	15.1	+	124	80	124	Yes
21	63	168	R.F.	2 weeks	75%	none	14	Normal	74	74	164	Yes
24	37	163	none	2 weeks	40%	M.I.	16.3	+	96	72	108	No
26	49	138	toxic goitre	2 months	90%	M.S.?	14.2	+	136	80	155	Yes
27	43	121	none	3½ months	60%	M.S., M.I.	12.5	+	92	80	120	No

EXPLANATION OF SIGNS AND CONTRACTIONS.—R.F.—rheumatic fever; Art. Scler.—arterial sclerosis; M.I.—mitral insuffi-
as measured in orthodiagram; Q.S.—quinidine sulphate; digitalis—when given within two weeks of commencing Q.S. is indi-
cardiogram.

as evidenced by hypertrophy and failure. The size of the heart as recorded is the greatest transverse diameter measured at right angles to the mid-line. In all but three cases, this was determined orthodiographically, which gives the actual size of the heart. The smallest heart had a diameter of 11 cm. Four of the total number had a diameter of 13.3 cm. or less. The remainder varied from 13.3 cm. to 20.5 cm. in diameter. The normal maximum is about 12.5 cm.

The heart rate recorded before the giving of quinidine sulphate is the rate as found on the day of commencing the drug, and estimated at the apex by auscultation. The rate in the different patients varied from 60 to 140 per minute.

Nineteen of the patients received a preliminary course of digitalis, thereby reducing the heart rate considerably compared with what it had been at the time of admission to the hospital. No rule was followed in the giving of this preliminary course of digitalis, but, when the patient appeared acutely ill, or was in definite distress, concentrated tincture of digitalis was administered for several days, or until the urgent symptoms had subsided. Where a patient is recorded as having received digitalis, it was given within a period of ten days prior to commencing quinidine, *i.e.*, about the total length of time over which digitalis will retain activity in the system after the giving of the drug has been discontinued.

CASES RETURNING TO NORMAL RHYTHM

Quinidine Sulphate	Result	Duration of N.R.	Toxic Symptoms	Changes in ekg. during treatment
1.6 gms. in 2 days	N.R.	6 days	Dizziness, head noises, epigastric discomfort, pain in back	Slowing of auricle
3.2 " " 2 "	N.R.	8 "		
2 " " 3 "	N.R.	6 "		
6.2 " " 11 "	Nil	——	2 months between the 6.2 and 18.9 gms., and 2 days between the 18.9 and 8.4 gms.	Nodal rhythm
18.9 " " 17 "	Nil	——		
8.4 " " 5 "	N.R.	6 days		
3.2 gms. in 5 days	Nil	——	abdominal pain, diarrhoea	Increase in T. 2 and 3
3.2 " " 3 "	N.R.	8 months		
3.6 gms. in 3 days	N.R.	40 days	none	Ventricular extra systoles after 3.2 gms.
3.8 gms. in 4 days	N.R.	9 hours	heart rate increased to 130. Sudden death	Increase in size of auricular contractions
3.2 gms. in 4 days	N.R.	5 months	none	Slowing of auricular rate
1.2 gms. in 1 day	N.R.	5 weeks	none. died of uraemia	none
2.4 gms. in 3 days	N.R.	8 days	H.R. increased to 124	Slowing of auricle
2.9 gms. in 5 days	N.R.	11 weeks	Palpitation and increase in heart rate	none
2.9 gms. in 5 days	N.R.	5 months	Diarrhoea	Slowing of auricle; flutter
0.4 gms in 1 day	N.R.	5 weeks	none	none
2.7 gms. in 6 days	N.R.	5 days	Nausea, epigastric pain; increase in H.R. to 148	Increase in size of auricular contractions
1.8 " " 3 "	N.R.	8 days		
4.8 " " 4 "	N.R.	7 days		
7.2 gms. in 10 days	N.R.	4 days	Nausea; syncopal attack; cerebral anaemia?	Slowing of auricle, ventricular extra systoles
3.2 " " 3 "	N.R.	5 days		
0.2 gms in 1 dose	N.R.	11 days	none	none
0.6 " " 1 day	N.R.	5 days		
0.6 " " 1 "	N.R.	3 months		none
16.9 gms. in 17 days	N.R.	5½ weeks	none	Flutter for one week
1.8 gms. in 3 days	N.R.	24 hours	none	none
1.6 " " 2 "	N.R.	11 weeks		
23.2 gms. in 23 days	N.R.	2 days	Palpitation, Slight epigastric discomfort. H.R. 160	none
1.6 " " 1 day	N.R.	4 "		

ciency; M.S.—mitral stenosis; A.I.—aortic insufficiency; A.S.—aortic stenosis; Size of heart—maximum transverse diameter cated 'yes'; N.R.—normal rhythm; Condition of arteries—+ sign indicates presence and degree of sclerosis; ekg—electro-

The recording of accurate blood pressure readings in auricular fibrillation is uncertain. To simplify the readings, only the systolic pressures have been recorded and the highest point at which any sound came through has been taken. The systolic pressures, thus estimated, ranged from 105 to 240 m.m. of mercury. In five of the patients no valvular defect could be discovered. Of the remainder, ten had mitral stenosis, either alone or accompanied by mitral insufficiency. Five patients had mitral insufficiency only. Seven had a defect of both the mitral and aortic valves. Fourteen patients had definite thickening of the palpable arteries.

In the majority of cases treated, the quinidine sulphate used was that prepared by Mallinckrodt, though for several patients the Howard or Merck product was employed. No variation in the different specimens, either in potency or toxicity, was observed. The drug was in all instances administered by mouth in gelatine capsules. Regarding the dosage and frequency of administration, there was some variation with different patients. On commencing the drug however, a definite rule of procedure was followed. This was to begin with a dose of 0.2 gm. On the following day, two doses of 0.2 gm., with a six hour interval between doses, were given, and on the third day, three doses of 0.2 gm. Following this, if no toxic symptoms had developed the dose was increased. With the earlier cases, a dose of 0.4 gm. was given three times a day. As the maximum effect of the drug is probably of short duration, the more recently treated patients have received smaller doses, given at more frequent intervals. The total dose for any twenty-four hour period never exceeded 1.8 gms.

Of the twenty-eight cases reported in the present series, sixteen ceased fibrillating; *i.e.*, fifty-seven per cent. of the total. Of these sixteen, eight are known to have reverted to fibrillation, leaving eight patients, or twenty-nine per cent. of the total in whom the normal heart rhythm has persisted. The period during which these patients have been under observation has

CHART No. II

No.	Age	W't	Predisposing Cause	Duration of Fibrillation	Estimation of Disability before Q.S.	Valvular Lesion	Size of Heart in cm.	Condition of Arteries	Ventricular Rate before Q.S.	Ventricular Rate after Q.S.	Systolic B.P.	Digitalis
2	43	163	none	2 years	75%	M.S., M.I.	15.5	Normal	80	120	130	Yes
5	49	—	none	3½ months	25%	A.S., A.I., M.S.	15.5	Normal	128	160	120	No
7	44	117	toxic goitre	8 years	50%	M.S.	13	Normal	80	180	120	Yes
8	50	166	R.F., art. sclerosis	15 months	100%	A.I., M.I.	20.5	+++	90	100	240	No
9	52	111	R.F., art. scler.	6 years	60%	M.S.	15.6	++	108	120	120	Yes
12	39	105	R.F.	10 months	50%	M.S., A.I.	17.5	Normal	112	176	130	No
14	66	101	S. throat, art. scler.	14 months	50%	none	11	+++	100	128	220	Yes
15	27	109	R.F., tonsillitis	?	100%	M.S., M.I.	16.5	Normal	106	124	110	Yes
22	50	—	Ex. goitre	3 years	60%	M.I.	16.5	Normal	120	186	150	Yes
23	29	103	none	22 months	60%	M.S., M.I.	13.8	Normal	66	101	126	Yes
25	77	158	none	1 year	90%	M.I.	18.5	+	72	—	140	Yes
28	50	115	R.F.	14 months	75%	M.S., M.I., A.S., A.I.	14.4	Normal	108	—	128	—

Explanation of Signs and Contractions.—R.F.—rheumatic fever; Art. Scler.—arterial sclerosis; M.I.—mitral insuffi-
as measured in orthodiagram; Q.S.—quinidine sulphate; digitalis—when given within two weeks of commencing Q.S. is indi-
cardiogram.

ranged, with one exception, from five weeks to eight months. This exception is a patient who died about ten hours after the return of normal rhythm. Deducting this patient, we have a total of seven, or twenty-five per cent. in whom the heart rhythm has remained normal for a period of five weeks or longer[†]

In four of the cases in whom fibrillation ceased but who later relapsed, treatment was repeated, and while a normal rhythm was again obtained (on as many as six different occasions in one patient) yet it persisted only for a few days, and it was it found possible to maintain it in these patients by repeated small doses. In this group the relapse usually occurred between the fourth and seventh day.

From a summary of the cases treated it may be said, that even a careful study of the patient and of his history, fails to give sufficient information to allow of an accurate forecast regarding the ultimate effect of the drug on the cardiac rhythm.

If the cases under consideration be divided into two groups:—one, those responding to treatment, and the other, those in whom no result was obtained, we find that while similar valvular lesions are found in both groups, yet in the group responding to treatment, there is a predominance of those cases in whom there was no valvular defect demonstrated. With regard to the length of time that fibrillation had been established, it appears probable that the cases of long duration may not respond so readily. The cases having a rheumatic or other infective origin, or arteriosclerosis for their possible causation appear about equally divided. The two patients in whom the blood pressure was over 200 failed to respond to treatment. Neither the size of the heart, as measured, nor the heart rate, would appear to have any bearing on the result.

Whether the giving of a preliminary course of digitalis is a factor in the result obtained is uncertain. Digitalis was given to nineteen patients,

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[†] In August, 1922—three months after the reading of this paper—only one patient in this series (No. 26) was known not to be fibrillating. Two others (Nos. 4 and 6), who had been discharged from the hospital with a normal rhythm, we have been unable to trace.

CASES UNINFLUENCED

Quinidine Sulphate	Result	Duration of N.R.	Toxic Symptoms	Changes in ekg. during Treatment
16.8 gms. in 13 days 19.7 " " 18 "	Nil Nil	——	Sweating	none
6.8 gms. in 5 days	Nil	——	Sudden death 3 mths. after q.s.	Increase in auricular contractions
13.2 gms. in 11 days	Nil	——	Palpitation	Flutter, vent. tachycardia
5.6 gms. in 6 days	Nil	——	Dyspnoea, cyanosis	none
10.6 gms. in 9 days	Nil	——	Dizziness	Flutter, slowing of auricular rate
1.8 gms. in 2 days	Nil	——	Cyanosis, palpitation, vomiting, precordial tenderness	Widening of vent. complex, vent. tachycardia
4 gms. in 5 days	Nil	——	Palpitation	Slowing of auricular rate
1 gm. in 2 days	Nil	——	None	Slowing of auricular rate: increase in size of auric. contractions
1.9 gms. in 4 days 0.4 " " 1 day	Nil Nil	——	Palpitation, headache, nausea, diarr., flushing, skin eruption, fulness in chest	none
28.1 gms. in 26 days	Nil	——	Dizziness, fulness in head	none
0.9 gms. in 2 days 1.2 " " 2 " 0.6 " " 2 "	Nil Nil Nil	——	Diarrhoea	none
1 gm. in 2 days 0.4 gms. in 1 day	Nil Nil	——	Palpitation, dizziness, shortness of breath and dazed feeling	none

ciency; M.S.—mitral stenosis; A.I.—aortic insufficiency; A.S.—aortic stenosis; Size of heart—maximum transverse diameter
cated 'yes'; N.R.—normal rhythm; Condition of arteries—+ sign indicates presence and degree of sclerosis.; ekg—electro-

and the percentage of cases receiving it in the two groups, responding and not responding to treatment, is about the same. The safer procedure, and one which should be adhered to, is to administer digitalis to all urgent cases at the outset, and later to decide on the advisability of using quinidine.

Turning for a moment to the clinical results obtained from the use of quinidine, the immediate effect of the return of the normal rhythm has been increased comfort to the patient. There has been in all instances either total cessation, or marked diminution of palpitation. Their breathing has been improved, and they were able to lie more comfortably in bed. The general appearance of the patients seemed definitely better with the return of normal rhythm, and their convalescence was apparently shortened.

In the series reported here, and in which may be included all our cases treated to date, one death has occurred. This patient was a man fifty years of age, who had been under observation for one year, during all of which time he had fibrillation of the auricles. There had been no evidence of a valvular lesion, and there was only a moderate degree of myocardial failure. He had, however, definite cardiac hypertrophy. This man received a total dose of 3.8 gms. of quinidine sulphate in five days, which ranges among the smaller total doses given. His rhythm returned to normal on the fifth day, and the heart rate to 80; at the same time his condition appeared excellent. Other than an increase in his ventricular rate during the treatment, he had shown no toxic symptoms. He died very suddenly about ten hours after the return of normal rhythm. He had been feeling very well, had got out of bed without permission and had gone to the bedside of another patient. A few minutes later he returned and was sitting on a chair by his bed when he was seized with a convulsive spasm, fell to the floor, and was dead when a house physician, who was in the ward, reached him. A complete autopsy failed to show the immediate cause of death.

In a number of cases treated, evidences of the effect of the drug, other than the production of normal rhythm, have been observed both clinically and electrocardiographically. Some of these are definitely of a toxic nature, and must be taken as danger signals, and an absolute indication for discontinuing treatment. Of these latter, the earliest to appear as a rule have been diarrhoea, epigastric pain, and nausea with or without vomiting. Other symptoms accompanying those mentioned or coming on a little later, have been palpitation, pre-cordial pain or tenderness, cyanosis, and marked increase in the ventricular rate. An additional ten or twenty ventricular contractions to the minute would not appear in itself to be an indication for discontinuing treatment.

From the results as shown to date in the patients treated, it would appear that the use of quinidine sulphate in the treatment of auricular fibrillation is justifiable. Before this statement is accepted more patients must be treated, and followed for a greater length of time than has been possible in the case of those reported here. While the changes in the condition of those patients in whom the heart rhythm became normal have not been dramatic, yet they would appear to be more striking than those which might have been expected from rest and digitalis alone. It seems probable that quinidine will eventually find a place in the therapy of heart disease. It is to be remembered, however, that it is a potent drug, often acting rapidly and occasionally accompanied by toxic symptoms, which in several instances in our experience have been alarming, and great caution must be exercised in its use. At the present time, the clinical application of quinidine in general practice is perhaps scarcely warranted. It is more safely confined to institutional therapeutics, where patients may be kept under closer observation and electrocardiographic studies made. This is more especially advisable since we have a very useful drug in digitalis, properly administered, for the treatment of auricular fibrillation.

Important precautions in the use of quinidine might be tabulated as follows: (1) Administer a course of digitalis therapy to all cases showing signs of acute failure before commencing the quinidine sulphate. (2) During treatment with quinidine sulphate, and for several days after discontinuing the drug, the patient must be kept absolutely in bed. (3) Commence with a single dose of 0.2 gm. on the first day, two doses of 0.2 gm. on the second day, and three doses of 0.2 gm. on the third day, observing closely for any toxic symptoms. If none appear, then after the third day the dose may be increased to 0.4 gm. three or four times in every twenty-four hour period. This dose should not be exceeded. (4) It would seem advisable that the patient should be seen after every dose or before an additional dose is given. (5) Electrocardiographic observations are of service in diagnosing important changes in rhythm, *e.g.*, the onset of flutter or the tendency on the part of the ventricle to assume an abnormally rapid rate, with consequent alarming symptoms of failure.

History and Partial Autopsy Report of Case, No. 6

Case No. 6.—Male; English; Age, 50 years; weight, 135½ lbs.; labourer. Admitted November 17, 1921, complaining of shortness of breath, and occasional precordial pain for the past year. He gave a history of having had gonorrhoea twenty years ago but no other illness.

The patient lies flat in bed with comfort, cyanosis slight, no engorgement of veins, no oedema. There is definite cardiac hypertrophy, the total transverse diameter of heart being 15.6 cm. The heart rate is 100, radial 80, completely irregular. There is no evidence of any valvular lesion. The heart sounds are distant. No evidence of passive congestion. No arterial sclerosis. Systolic blood pressure first at 124. Temperature, normal. Urine, normal; Wassermann, negative.

No digitalis was given. From November 20 to November 24 he was given 3.8 grams of quinidine sulphate, at which time the heart rhythm became normal and the rate was 80. The highest heart rate recorded was 130 on November 21. The largest amount of quinidine given in one day was 1.2 gm.

This patient died suddenly nine hours after the heart rhythm was observed to be normal. He had been examined half an hour previous to death, when he had no complaints, and said he felt well. On that examination nothing abnormal was discovered; no heart murmurs audible. Blood pressure, 118/80. A complete autopsy was performed and the cause of death was not ascertained.

AUTOPSY REPORT (ABSTRACT)

Pericardial Cavity; Contains about 8 c.c. of slightly blood-stained fluid.

Heart: Measures 15 cm. in diameter in the 4th interspace. Weight, 520 grams. The pulmonary artery opened *in situ*, and considerable free blood escaped, but there is no evidence of any embolus or thrombosis. Over the posterior portion of the right ventricle, towards the apex, there is a whitened area about the size of a ten cent piece. On opening the right ventricle this area cuts with much resistance as if it were fibrous tissue. All chambers of the heart are large and apparently in diastole; contain considerable post-mortem blood clot; the least being found in the left ventricle. On mitral and tricuspid valves there is a slight thickening of the edges of the valve curtain; otherwise, valves normal. The left ventricle measures 2 cm.; the right ventricle, 0.4 cm. The four chambers of the heart are somewhat dilated. The heart muscle appears of good quality.

The Aorta measures 5.5 cm. at a distance of 4 cm. above the valve curtains. The coronary arteries are clear and show very little evidence of any atheroma.

Pleural Cavities are free from fluid. There are no adhesions in the left, but several firm fibrous adhesions about the apex of the right lung.

Right and Left Lung.—The vessels and bronchi are clear.

Brain removed. There is some oedema; more on the right side than on the left. The vessels carefully examined are found to be clear. On section nothing abnormal is found.

Microscopic Findings:

Heart.—Considerable pericardial fat. Vessels are engorged and show some sclerosis. There are one or two areas of fibrous tissue with bundles of various sizes scattered through it and also some fat globules. There is much fragmentation of muscle fibres. Thickening of the endocardium with some fatty degeneration of the fibres beneath it.

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THE DIAGNOSTIC VALUE OF THE AGE INCIDENCE OF CERTAIN DISEASES IN CHILDREN*

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A KNOWLEDGE of the age incidence of many diseases in children is of considerable diagnostic value because some diseases are extremely rare before, and occasionally after, certain ages. In the present paper the author has endeavoured to collect scattered data from the records of a large children's hospital bearing on this subject. The age of the patients varied from birth to fourteen years. The following diseases have been considered—endocarditis, rheumatic fever, chorea, scurvy, tetany, intussusception, appendicitis, typhoid fever, pyloric stenosis, pyelitis, diabetes, measles, scarlet fever, diphtheria, mumps, and whooping cough.

Endocarditis, rheumatic fever and chorea have been considered in one group on account of the probability of a common etiological factor in these diseases. The records of 361 cases have been examined. Of these, eighty-two had chorea alone, seventy-four endocarditis alone, and forty-six rheumatic fever alone. Endocarditis and rheumatic fever occurred together in eighty patients; endocarditis and chorea in fifty-seven patients; and endocarditis, rheumatic fever and chorea in fourteen cases. In eight patients rheumatic fever and chorea only, occurred together. From these facts it is evident that the combination of endocarditis and rheumatic fever is encountered more frequently than the combination of endocarditis and chorea, while rheumatic fever and chorea together without endocarditis is comparatively rare. Out of the total of 225 cases which showed some signs of cardiac involvement, only one patient was under four years of age. Out of the 161 cases with evidences of chorea only two were in patients under four years of age, while out of the 148 patients with signs of rheumatic fever three were under four years of age.

From these figures we see that only six cases, or less than two per cent. of a total of 361, were in patients under four years of age. It is therefore evident that endocarditis, rheumatic fever and chorea are of infrequent occurrence before this period. Of these six cases, five were over three years of age. The youngest patient with endocarditis which I have personally seen was one and one-half years of age, although a case has been reported recently which occurred in an infant only three and one-half weeks old. It is obvious that the age incidence of endocarditis in particular, is of great practical value for the differentiation in children of acquired murmurs from those of congenital or functional origin.

Scurvy.—The records of forty-eight cases of scurvy were examined. Thirty-six cases, or seventy-five per cent., occurred in infants from eight to twelve months of age. Only two cases were encountered before eight months of age, one at four months and one at seven months. At the other extreme, only two cases occurred in children over one and one-half years of age. These were two and four years old respectively. The diagnosis of scurvy is relatively simple for those at all familiar with the disease. However, a mistaken diagnosis of rheumatism is frequently made. A study of the age incidence of the two diseases shows that the question of a differential diagnosis need hardly ever be considered.

Tetany.—The age incidence of tetany is of considerable interest in view of its close association with rickets. Schmorl, as the result of an intensive investigation of the latter disease, concluded that microscopic evidences of rickets in the long bones appeared as early as the second month, although clinical evidences of the disease did not appear until the third month. The records of 119 cases of tetany were examined. Two cases occurred at seven weeks, one at eight weeks and one at ten weeks. From four to twelve months of age there were ninety-one cases, or seventy-six per cent. of the total. Only two cases were encountered after the eighteenth month, one at twenty-four months and one at thirty months.

Intussusception.—The records of 100 cases of intussusception were examined. In no disease is the necessity for an early diagnosis and appropriate treatment more imperative in order to avert a fatal result. It most frequently began suddenly with vomiting, colic and screaming. Frequent small stools which consisted largely of blood and mucous, and general prostration followed. A tumour was felt in over seventy-five per cent. of the cases. Of the 100 cases, sixty-five were in infants from four to ten months of age. Only two were under four months of age, one at one and one-half months and the other at two months. Occasional cases were encountered up to eighteen months of age, after which period only about one case occurred at each year. It is seen that the age at which intussusception occurs most frequently is also the period at which infectious diarrhoea is encountered. In both instances there may be vomiting and frequent bloody stools. The onset in intussusception is more abrupt however, and a tumour can usually be palpated. The possible presence of intussusception should always be considered in any infant with vomiting and bloody stools particularly if the patient is between four and ten months of age.

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*Read before the Meeting of District No. 5 Ontario Medical Association, Toronto Academy of Medicine, Nov. 7th, 1922.

Appendicitis.—The records of 150 cases of appendicitis were examined. This disease most frequently began with pain in the abdomen and nausea and vomiting. Some rigidity and tenderness were always present and were generally localized in the right lower quadrant of the abdomen. In a number of patients a mass was felt. Of the 150 cases only one was under two years of age. This patient was eight months old. Two cases occurred in children in their third year. The age at which the disease was encountered most frequently was between eight and fourteen years of age.

Typhoid Fever.—Until recent years it was thought that typhoid fever did not occur in children under two years of age and occurred but rarely before five years. During the past fifteen years a number of cases of typhoid fever in infants and young children have been reported. The youngest case recorded by Holt and Howland was in a child of eight months of age while Griffiths reported the occurrence of typhoid fever in an infant three months of age. Other cases occurring at an earlier age than these have also been reported. The present series consists of sixty-four cases. The youngest was a male infant five months of age. A positive Widal test and blood culture made the diagnosis unquestionable. The next case occurred at nineteen months. A total of twelve cases were encountered before five years of age. A point of considerable interest is that although only thirty of the sixty-four cases were in male patients, of the twelve under five years of age, ten or nearly eighty-five per cent. were male children.

Pyloric Stenosis.—In view of the probable congenital origin of pyloric stenosis, the time of the initial appearance of the symptoms is of considerable interest. The disease is characterized by sudden, forcible vomiting of a large amount of fluid two or three times a day. This occurs whether the infant is breast or artificially fed. The patient is generally constipated, loses weight and visible peristalsis of the stomach may be seen, particularly after taking fluids. A palpable mass in the region of the pylorus may be felt. The records of sixty-five cases were examined. In fourteen cases the initial symptoms of vomiting first appeared shortly after birth. This is probably a larger number than should be recorded for this period and I have little doubt that if the information in these cases had been obtained with greater care the number would have been considerably smaller. The symptoms first appeared on the second day in one case, on the third day in one case and also on the fifth day in one case. In only three infants did the initial symptoms begin when the patient was from one to two weeks of age. From two to four weeks of age the initial symptoms appeared in thirty-three cases or slightly over fifty per cent. of the total. The latest period at which the symptoms were first observed was seven weeks. It is thus seen that from two to four weeks after birth is the period at which the initial symptoms of the condition most frequently appear.

Pyelitis.—There is probably no disease in infancy which is overlooked with greater frequency than pyelitis. The possible presence of this disease should always be considered in any infant with an unexplained fever. In older children and occasionally in infants other signs may be present, the most frequent being, chills, frequency of micturation, enuresis, vomiting, loss of weight, pain in the renal region and lower part of the abdomen and occasionally blood in the urine. The diagnosis can be made with certainty only by the microscopic examination of the urine. The records of ninety-seven cases were examined. Of these, fifty-four were in infants from three to eighteen months of age while only forty-three in children from eighteen months to twelve years of age. No cases were encountered in infants less than three months old. Of the ninety-seven cases, seventy-seven, or eighty per cent., occurred in females. Thus the sex is probably a more important factor than the age in the diagnosis of the disease.

Diabetes.—This disease is not at all common in children. It is much more acute, however, than in the adult and the result is almost invariably fatal. The records of only fourteen cases were obtained. Of these, two occurred under five years of age, one at thirteen months and the other at four years. The blood sugar in the thirteen months old patient was 0.27 per cent. The other cases were about equally distributed at from five to fourteen years of age.

There are a number of diseases other than the ones already discussed in which the age incidence is an important factor in making a diagnosis. As these other diseases are contagious and when diagnosed are usually either treated at home or sent to special isolation hospitals, the records of the cases occurring in the Hospital for Sick Children have not been examined. It is desirable however to mention briefly some of these conditions.

Measles is a disease which is sometimes quite difficult to diagnose especially when the patient is seen for the first time. In infants certain skin conditions may produce a similar appearance of the skin to that which occurs with measles. It is therefore of value to know that measles is rarely encountered before six months of age and is extremely rare before four months. The records of 1,031 cases were obtained from the Toronto Department of Public Health. Of these 1,031 cases only six cases were under six months of age and only one under four months of age.

Scarlet Fever.—The susceptibility of children to scarlet fever increases up to five years of age, after which period it gradually diminishes. The disease is quite rare during the first six months of life and numerous instances have been recorded of nursing infants who did not contract the disease after prolonged exposure to it.

Diphtheria.—Over ninety per cent. of new born infants have a natural immunity to diphtheria. This immunity is gradually lost in a large number of cases by the third or fourth year. The age at which the disease most frequently occurs is from two to six years. It is quite uncommon during the first year of life, and especially during the first six months. However I have personally seen one case which occurred in an infant three weeks old.

Mumps.—The occurrence of mumps in children under two years of age is infrequent.

Whooping Cough may occur at any age during childhood and in contradistinction to other infectious diseases is frequently encountered during the first six months of life. The majority of cases occur under six years of age.

SUMMARY

Endocarditis, rheumatic fever and chorea are rarely encountered in patients under four years of age. Out of 361 patients with these diseases only six were under four years of age and only one under three years.

Scurvy is most frequently encountered in infants from eight to twelve months of age. Only one patient out of a total of forty-eight was under seven months of age. The oldest was four years of age.

Tetany is most frequently encountered at from the fourth to the twelfth month. The youngest patient out of a total of 119 was seven weeks old.

Intussusception.—Sixty-five per cent. of 100 cases occurred in infants four to ten months of age. Only two cases were seen before four months of age, one at one and one-half months and the other at two months.

Appendicitis.—Out of 150 cases only one was under two years of age.

Typhoid Fever.—Out of sixty-five cases only two were under two years of age. One was five months old and the other nineteen months.

Pyloric Stenosis.—The symptoms of pyloric stenosis usually first occur in patients from two to four weeks of age.

Pyelitis.—No cases of pyelitis were seen in patients under three months of age

Diabetes.—Although uncommon may occur at any age during childhood.

Measles, scarlet fever and diphtheria are rarely seen before six months of age.

Mumps is infrequently encountered before two years of age.

Whooping Cough may occur at any age during childhood.

The author desires to acknowledge his thanks to Dr. Alan Brown, Physician-in-Chief and Dr W. E. Gallie, Surgeon-in-Chief for permission to use the records of this hospital.

POST-WAR HEALTH PROGRAMME, HALIFAX, NOVA SCOTIA

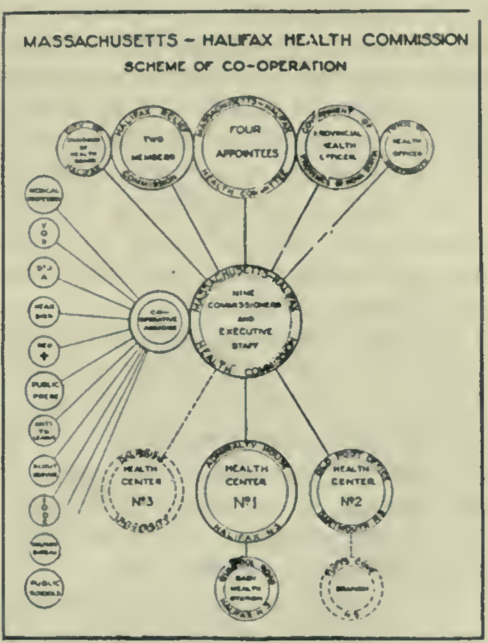
INTERNATIONAL AMITY EXEMPLIFIED

B. Franklin Royer, M.D., D.Sc.

Executive Officer, Massachusetts-Halifax Health Commission and Director of Public Health Nursing, Dalhousie University

THE spirit of co-operation and fraternity during the war was nowhere better shown than in the spontaneous generosity of the State of Massachusetts to the stricken city of Halifax after the explosion there in December, 1917. Besides ship-loads and train-loads of supplies, and a corps of doctors and nurses, a committee of public spirited citizens within a very short time had raised a Relief Fund of $750,000. When the period of emergent relief had passed, there still remained unexpended in the hands of the Boston Committee, approximately $250,000. After a careful survey of Halifax by an expert, Dr. Victor G. Heiser of the International Health Board, it was decided that, because of overcrowded conditions, certain to obtain during the years required for restoration, rebuilding and rehabilitation, a much greater public health effort would be required than formerly, to keep the sick rate and the death rate from rising. It was therefore recommended to the Boston Committee that this money be expended in a Public Health and Preventive Medicine Campaign, to extend over a period of five years. Thus was organized, for the furtherance of this recommendation, in October, 1919, the Massachusetts-Halifax Health Commission, an outstanding example of the international amity between the two great countries of the North American Continent.

It seemed an opportune time to inaugurate in Halifax a campaign for positive health, to apply the old adage, prevention is better than cure: to inculcate in the people an ideal for physical and mental vigor; to build up a desire for, as well as an appreciation of, clean, healthy homes and home surroundings; to create a demand for clean pure water, milk and other foods; in other words, to educate one and all in the newer ideas of nutrition, hygiene and sanitation, thus making possible the closest co-operation and sympathy between the people, the City Health Board and the Commission.



The primary need in carrying out this programme was a corps of efficient public health nurses. The demand for public health nurses elsewhere made it impossible to secure a sufficient number. In order to supply personnel, the Executive Officer of the Commission, in a conference with officials of the Red Cross of the Province, advised that Society to join with the Massachusetts-Halifax Health Commission and the University of Dalhousie in establishing a university course in public health nursing. This was done, and the co-operation of the Provincial Board of Health, the Victorian Order of Nurses, the Welfare Bureau, the school authorities and other local welfare and charitable organizations was also secured. By September, 1920, a class of thirteen graduate nurses, fully trained for all kinds of public health work was made available for community service—the first public health nurse graduates in Canada. Some of these nurses have been taken over by the Commission, others are employed by the Victorian Order of Nurses, and, through the generosity of the Provincial Red Cross Society, still others are engaged as public health nurses in the various counties. Since 1920, two other classes have graduated, and the fourth class is at present in session, so that the course in Public Health Nursing, so ably sponsored, has become well established.

The work of the Public Health Nurse in the Massachusetts-Halifax Health Commission is wholly instructive and constructive in character. Contact, once established through the clinic or the home, is maintained, and an effort is made to have all health teaching reach every member of the household. Public health nurses ably supported by the visiting housekeepers, seek to inculcate right methods of living and to re-educate and train the family in methods of prevention, chiefly by building up a desire for positive health.

No bedside work is undertaken. The bedside work in Halifax and Dartmouth is done efficiently by the Victorian Order of Nurses. During the time of acute illness, requiring bedside care, the Victorian Order do the only health teaching in the home; at the conclusion of this bedside service, home teaching is resumed by the public health nurses.

At the present time the public health nurse is actually teaching in one family out of every six in the community. In hundreds of instances, her trained eye sees the need of a doctor earlier than would the mother, and her insistence prompts an earlier call, and no doubt often leads to a speedier recovery with perhaps fewer visits than if the doctor had been called in later.

The greater part of the work of the Commission is connected by its several Health Centres. Health Centre No. 1 is held at Old Admiralty House, which, through the Department of Naval Affairs, was placed at the disposal of the Commission, and which is admirably adapted for the purpose. Health Centre No. 2 is situated at the Old Post Office, Dartmouth, for that town, from its proximity on the opposite side of the harbor, suffered considerably in the same disaster. A Baby-Clinic substation is held each summer in another section of Halifax, and in July of this year (1922) a weekly clinic was opened at Tufts Cove in the outskirts of Dartmouth. During the latter part of the summer, a survey was made in Africville, a section of Halifax populated by colored people, and since that date a regular clinic service has been maintained there with good results. To cover these activities, the Commisson has appointed a medical and dental staff, and has engaged one chief nurse, two supervisors, fourteen public health nurses, three visiting housekeepers and two special clinic nurses.

In Health Centre No. 1 there are held the following clinics:—Tuberculosis, now under Drs. Sieniewicz and Grant; Baby Welfare, under Dr. Wiswell; Eye, Ear, Nose and Throat, under Drs. MacLennan & Hemmeon; Psychopathic, under Drs. Kenneth McKenzie and J. G. MacDougall, for taking care of certain of the explosion injured, (this will soon be discontinued); Pre-school age Dental, under Dr. Arrabelle MacKenzie; Nutrition, under Dr. F. W. Tidmarsh; Posture, under Dr. Alan Curry; Pre-school age Welfare, under Dr. Turel. In addition, a Venereal Diseases Clinic, under Dr. Glen Donovan, is held three times a week at the Health Centre, under the Provincial Department of Health in co-operation with the Massachusetts-Halifax Health Commission.

The Tuberculosis Service aims to furnish free medical and nursing advice to all persons unable to pay for it, and to have a public health nurse impress the lessons of right living, feeding, ventilation and the importance of frequent re-examination for the afflicted and exposed. Six clinics are conducted each week. The full-time expert in charge of the tuberculosis clinics is also available free to the city physicians as consultant, and to the city as attendant physician in the Tuberculosis Hospital. During the college year, he delivers a series of lectures on his subject to the medical students of the third, fourth and fifth years at Dalhousie University.

The Baby Welfare service is largely for the guidance of mothers in the pre-natal period, and through the years of infancy and childhood. It is to a certain extent, a well-baby clinic, and yet, from its inception, medical advice has always been given at the clinic to those mothers who, from necessity, must have it free. At the present time, the total enrollment in this service is about 600. Nurses are considered as of quite as much or more value than doctors in this service, the medical touch being given in great part for the purpose of establishing public health nursing contact with the family and having the nurses in the home establish that environment essential for health-building.

The Commission felt that, in view of the fact that eye strain, diseased tonsils and adenoids have a distinct relationship to preventive medicine, Eye, Ear, Nose and Throat clinics were most essential. The enrollment in these services has reached a total of 541. At certain seasons of the year, operations are performed for the removal of tonsils and adenoids in the necessitous not able to secure admission to the hospitals of the city.

The Psychopathic Clinic was organized for intensive study and supervision of certain of the explosion injured, with sequelae comparable to those following war injuries. A specially trained nurse follows all cases to their homes for the purpose of superintending the medical and suggestive treatment. The number enrolled in this clinic is gradually lessening.

The Pre-School Age Dental Clinic at Health Centre No. 1 has the distinction of being the second of three purely pre-school age dental services on the North American continent. It is coming to be realized that in order to make sure of sound permanent teeth in the adult, right methods of nourishment should be established months prior to the child's birth, and periodical examinations should be conducted during the infant and pre-school age period. This clinic has the warm endorsation of the local dental profession, and has proved a successful innovation—400 children coming four times a year for inspection, advice and treatment. The School dentists have stated that since the inauguration of this clinic, there has been a marked improvement in the teeth of the entering school children.

The Nutrition Clinic is a direct result of the findings of the other clinics. In both Halifax and Dartmouth, weekly classes are held, when the children, in many cases accompanied by the mothers, come to be weighed and measured. The doctors and nurses in charge of these services give interesting popular talks to the children, interspersed with health games and songs which the children enjoy, and at the same time profit by. The individual charts of the children show marked improvement during the year.

This Nutrition service has become rapidly popular, and in order to make it more effective, several visiting housekeepers have been engaged to supplement the work of the Public Health nurses. Besides meeting the children at the clinics, they go into those homes where nutrition problems are paramount, establish friendly relations with the mother and give practical demonstration and advice as to what to buy and how to cook it. In many cases they shop with the mothers, showing them just what meats they should choose for purchase, etc. It is also planned to have Domestic Science Classes at the Health Centre where inexperienced or prospective wives can be trained in the various branches of housekeeping.

The Posture service aims to recognise incipient errors and correct faulty habits, utilizing manipulative procedure and exercises, with hospital routing in the occasional case when necessary.

The Pre-School Age Welfare Clinic developed as an overflow from the Baby Clinic, and to fill a need for food and habit guidance in the growing child who is undernourished.

The Venereal Diseases and Skin Diseases Clinic has an average enrollment of 140. The former, organized under Dominion and Provincial Government support, treats and teaches the afflicted, and serves as a consulting unit in the Health Centre. Patients having positive Wassermann reactions are routed thither for routine treatment.

In order that the various Health Centre Clinics might have the advantage of scientific investigation and check, and that the physicians of the community might be given greater diagnostic laboratory advantages, permission was obtained from the Provincial Government to place a full-time pathologist-bacteriologist with technician in the provincial laboratory. These places were filled in June, 1921, and the scientific services are being appreciated by physicians and by the public.

The work of the first Health Centre, when reviewed by representatives of the International Health Board of the Rockefeller

Foundation, influenced them to earmark $200,000 for building a Health Centre on Dalhousie College Campus to perform a similar service for the south end of Halifax. The old Halifax Dispensary, which has been serving the necessitous in Halifax for many years, will merge with the new centre, and perform there its functions as a therapeutic agency.

The function of the Dalhousie Health Centre, which will distinguish it from its predecessors, and in fact, make it quite unique in a wider sense, will be its service as an out-patient department for the group of four hospitals in the immediate vicinity. Here university students will have an opportunity to acquire the right attitude of mind toward community service. They will study the social and domiciliary causes of illness as they study cases. The student's record will be checked against the health workers record for confirmation of observation. In this way, students will have a greater opportunity for practical training in preventive medicine than can be offered at any other point on the American Continent.

Health Centre No. 1 is situated advantageously, and possesses beautiful and extensive grounds, which are being made use of in various ways. The garden space has been divided up into lots which have been taken up by about thirty families living in cramped quarters, and in this way they are able to cultivate a plentiful supply of health-giving vegetables, and acquire a taste and desire for a real home with garden.

During the summer of 1921, part of the grounds were occupied as an open-air camp for mal-nourished children under the supervision of the Anti-Tuberculosis League with most beneficial results.

The graphs accompanying this paper show convincingly the success that has already followed even the partial adoption of modern public health ideas. Infant mortality which was 187.5 per thousand for the ten-year period ending September, 1919, has dropped steadily since that date, and for the year 1921-22 reached 97.5. The general death rate, which was 20.2 per thousand for the ten-year period, has dropped to 14.3 in 1922. Credit for this decrease must be apportioned among all operating agencies, but at least half is due to the newer type of endeavour.

Notable as these reductions are, the rates are still far too high. The death rate among infants ought to be brought well down in the 60's and the general death rate should be brought down to 13 per thousand of population, and possibly, for a period of years, even to 12½. Having seen the reward of their labours after just a few years' effort, all agencies have been stirred to greater endeavour, and we feel sure that the next five years will show a continued decrease in both general and infant mortality.

The demonstration undertaken is intended to be so convincing, that at the close of the Commission's existence, all the various phases of its work will be taken over by the Boards of Health of the City of Halifax and Town of Dartmouth, and will furnish another example of the inestimable value of preventive medicine.

ONTARIO MEDICAL ASSOCIATION

Forty-Third Annual Meeting

WINDSOR

May 29th, 30th, 31st and June 1st, 1923

The profession of the Border Cities who have this meeting in hand and who have been laying and perfecting their plans since June of last year, are now in a position to announce that all is in readiness for one of the best meetings in the history of the Association.

Preliminary Programmes will be issued shortly. Make your plans now to attend. And remember that a right royal good time awaits you.

— PLAN TO BE THERE —

Case Reports

PRIMARY CARCINOMA OF THE PROSTATE, WITH EXTENSIVE GLANDULAR ENLARGEMENT, AND PAIN ALONG COURSE OF SCIATIC NERVE

J. F. Haszard, M.D.

Penticton, B.C.

White male, age 61, rancher, first seen in August, 1922, complaining of pain and tenderness in his right leg. He had always enjoyed robust health with no previous illness. There was a history of an accident in December, 1921, in which he sustained some bruising of the lower back. Physical examination revealed only a few carious teeth and a definite tenderness along the course of the right sciatic nerve. Dental treatment was advised and carried out, with no improvement in the main symptoms.

The patient was seen again in the country on November 15th. At this time he had been in bed for a month. He seemed to have lost weight and strength quite out of proportion to the symptoms and the physical findings. He was admitted to Penticton Hospital, December 5th, complaining of pain in the right leg, slight bladder irritation and a moderate degree of constipation.

Physical examination, on admission; T. 99, P. 110, R.24. Marked loss of weight and strength. No enlargement of the superficial lymph nodes. Pupils equal and active. Knee and ankle jerks present. No Babinski. *Heart* slightly enlarged to the left, otherwise negative. *Chest* somewhat emphysematous, numerous wheezy dry râles throughout. *Abdomen* distended in left lower quadrant, liver and spleen not palpable, no masses palpable. *Per rectum* prostate not enlarged, not fixed, not hard, no nodules palpable, no masses felt in the pelvis. *Right leg.*—Definite tenderness along the course of the sciatic nerve as noted previously. There was no oedema nor swelling. *Urine;* negative on repeated examinations; no frequency, retention or incontinence. While under observation in hospital, the patient suffered greatly from pain in the right leg and latterly in the left hip. On account of a rather obstinate constipation, not altogether relieved by enemata, together with the negative findings on examination of the prostate and urine, a tentative diagnosis was made of carcinoma of the large bowel (probably descending colon) with metastatic pelvic glands. Unfortunately arrangements for a barium enema had to be cancelled as the patient developed a terminal broncho-pneumonia on December 15th and died December 20th.

At autopsy, besides the pneumonic condition of both lungs and a chronic adhesive pericarditis, there was found a small primary focus in the prostate (less than 1 cm. in diameter) which proved to be adeno-carcinoma on laboratory examination. There was no appreciable enlargement of the gland, although it was slightly firmer than the normal. The bladder and urethra were not involved. There were, however, massively enlarged pelvic glands on both sides, with direct extension to the retroperitoneal glands up to a point two inches below the diaphragm. Many of these measured 5 and 6 cm. in length. In spite of the pelvic growths the wall on the left side was quite smooth and to this may be attributable the failure to discover them on rectal examination.

A few mediastinal glands showed early metastatic growths and there were also a few scattered areas of carcinomatous growth about 1 cm. in diameter, throughout both lungs. The gastrointestinal tract was negative, except that a portion of the descending colon for a distance of six inches above the sigmoid was dilated and of paper thinness. No obstruction could be found to account for this. All other organs were negative on careful inspection.

The features of this case which made diagnosis difficult were:

(1) The unusually small primary growth, with no encroachment on adjacent structures.

(2) The smoothness of the pelvic wall, notwithstanding the very great enlargement of the pelvic glands. The masses higher up were masked by the abdominal distention, which rendered palpation difficult.

(3) The cachexia and grade of anaemia present were relatively slight in proportion to the size and extent of the secondary growths.

Editorial

ON RUPTURE OF INTESTINE

ATTENTION is directed to a paper on "Rupture of the Intestine," published in this issue of the *Journal*. The subject is covered at length and this may discourage some of our readers who may at first glance consider that it is for the perusal of surgeons alone. Not so. In this, more than in many surgical conditions, early diagnosis is the all important factor in the prognosis, and inasmuch as the accident more commonly effects active and vigorous young adult males, its early recognition and prompt treatment have a definite economic value of national importance in a country such as ours. The physician who first sees the patient must appreciate the variety of the violence which may produce rupture of the intestine; must recognize the early signs or suspicions of the condition; and must assume with the courage of his convictions the responsibility of radical treatment. Unoperated cases have a mortality of 100%, whilst delayed operation is almost as bad. To "wait and see" spells death. A.T.B.

THE MENACE OF TYPHOID

THE remark attributed to the late King Edward VII. in reference to tuberculosis, "If preventable why not prevented," is very apropos in regard to typhoid fever in this day and time. The statement in this issue of the Chief Medical Officer of health for Ontario in reference to the epidemic of typhoid fever at Cochrane, makes a story to give pause to the optimist who thinks that everything possible has been done to eliminate this scourge. When we compare a mortality for the Province of Ontario of 37.8 per 100,000 in 1906 with one of 7.2 in 1921, it points to a remarkable achievement and it is a still greater achievement that the cities of Ontario had a death rate of 51.3 in 1910 and of only 4.3 in 1922.

It may be noted that for the large cities of the United States, the combined death rate was 19.59 per 100,000 in 1910 and 3.15 in 1922. The three great causes for the improvement in these figures may be set down as better water supply, better milk supply and more efficient sewerage, and in these directions the city has a great advantage over the small town and the country village, but no effort toward the improvement of the death rate as a whole can succeed until the country village and the small town have water supplies which are placed beyond the reach of suspicion. Familiarity breeds contempt and a potential danger to a water supply may be overlooked or ignored until the expected happens.

The recent epidemic at Mansonville, Quebec, is a case in point. According to the information furnished us, a water supply for years regarded as ideal, was contaminated during the spring thaw from a case of typhoid in a house from which sewage flowed into a brook which fed the reservoir. Is this not a good time to examine the locks on many other stable doors throughout Canada, before other valuable horses are stolen? It is not too much for medical men everywhere to demand that not only shall the water and milk of their districts be uncontaminated, but what is more difficult but equally imperative that they shall be "every day and in every way" beyond the risk of accidental contamination.

The water supply into which any sewage *can* come is one into which on some day typhoid *will* come, and if a "certified" water cannot be attained, efficient chlorination would seem indispensable. To popularize anti-typhoid inoculation should be our duty particularly for everyone in an infected area, and also for those who plan vacations in the country where they run the added risks of newcomers in a possibly infected locality.

A. H. G.

AN EMPIRE-WIDE MEDICAL SOCIETY

ONE of the results of the great war seems to have been a quickening of the more or less latent regard which the Mother Country, and each of the self-governing Dominions have always entertained for each other in respect of their medical professions. In Canada, and particularly in Ontario, then Upper Canada, the legislative and other standards of the profession were well and truly laid in the early days by men who, with but few exceptions, came from the great schools of London, Edinburgh and Dublin. Many of them came first to Canada as medical officers of the Navy or the Army. Legislation upon medical matters, both in the older provinces as Nova Scotia, and in those more lately organized, as in the west, followed naturally the same precedent. The same influences were doubtless at work in the early organization of the profession in Australia, New Zealand, and South Africa, while in the smaller outposts of Empire, such as the West Indies, Singapore, Hong Kong, British Guiana, the connection of the local medical profession with that of the Mother Land has been even more direct and intimate.

The great war did more perhaps than has been recognized yet to establish between the medical services of the mother land and the outlying Dominions that foundation of acquaintanceship and mutual respect upon which, if once it be laid, there tends to rise automatically a comely superstructure of active fraternity and goodwill. So that we are not surprised to find that within the last year or two the parent society, the British Medical Association, has arranged a greatly extended and more close relationship with the profession in New Zealand, Australia, and South Africa, as well as in the smaller British communities dotted all about the Seven Seas.

It would seem that if this *rapprochement* is desirable in the other Dominions it is at least equally so in Canada, and this would seem to be the opinion of the profession here, if we can judge by the replies received to a questionnaire recently sent out to the profession at large by the Associate-Secretary of our Association. One of the points in the questionnaire was whether an invitation should be sent to the British Medical Association to meet again in Canada, perhaps in 1926. Of 1328 replies received, 28 said no, 1227 said yes, and 73 did not answer this particular question. This result should be fairly conclusive as to the position likely to be taken if the question comes up, as is expected, at the Montreal Meeting of the C.M.A. in June next.

There is also the larger and more important question of some form of affiliation between the Canadian and the

British Medical Associations. The sentimental reasons for such a liaison lie upon the surface, and like the bonds of Empire may be found to be all the stronger because sentimental. No close and binding arrangement involving much additional financial responsibility or any impairment of local autonomy could be desired by either body. But an official connection with the British Association and through it with the professions of the other Dominions has in it a great appeal to the imagination, and if the Executive of the Canadian Medical Association should see fit to request the attendance at the Montreal meeting this year of two or three accredited representatives of the British Medical Association, the request would meet with an immediate and cordial response from the latter body, and a discussion would be initiated which could hardly fail to bring about desirable results.

J. T. F.

INDUSTRIAL MEDICINE IN RELATION TO PUBLIC HEALTH

THE development of the industrial system of to-day from the trade guilds of the middle ages has transformed the whole life of civilized nations, and industrial medicine which deals with the well-being, safety and human rights of the vast majority of the population has become one of the most important branches of public health.

The problems of industrial medicine come under three general headings: (1) the prevention and control of communicable diseases; (2) the correction of unhygienic conditions of life and work which determine or contribute to premature death; (3) the prevention of occupational diseases and industrial hazards.

It is only in recent years that we have begun to understand and appreciate the underlying principles of the conditions affecting the health of industrial workers, such as ventilation, hours of work, fatigue, light, cleanliness, temperature, humidity, etc., etc., and of the many factors that determine the condition of health and longevity of man, perhaps none is so important as his daily occupation. In some instances, the conditions which make an industry hazardous originate from the employer's negligence or ignorance; in others it is in the nature of the industry itself; finally the industrial worker suffers many avoidable accidents and preventable diseases through indifference, carelessness, or lack of knowledge. For both employers and employees the most vital problems of to-day are in connection with those matters concerned with the health of industrial workers.

B. L. W.

THE IMPROVEMENT OF PROVINCIAL RELATIONS IN THE PROFESSION

THE spirit of the present day in all activities, professional, commercial, industrial, educational or other, is that of "getting together." Individualistic effort in large affairs or projects is passing and being rapidly supplanted by more communalistic endeavour. The war has emphasized by demonstration the result of mass thought and action, and we see many other illustrations of this in our daily lives.

In order that the maximum results and greatest benefits might ensue to all the profession of Canada, the Canadian Medical Association has for many years felt the need of closer relations with the various provincial associations or organized units of the medical profession in Canada. To this end a Committee on Provincial Relations has been appointed who will report, if possible, to the meeting in Montreal in June next. The Committee appointed is thoroughly representative, the personnel being as follows:—

Dr. J. S. MacEachern, 200 MacLean Block, Calgary, Alta.
Dr. R. G. Ferguson, Fort Qu'Appelle, Sask.
Dr. D. A. Stewart, Ninette, Manitoba.
Dr. E. R. Secord, 112 Market Street, Brantford, Ont.
Dr. A. T. Bazin, 583 Dorchester St. W., Montreal, Que.
Dr. W. F. Roberts, St. John, N.B.
Dr. S. L. Walker, Halifax, N. S.
Dr. A. MacNeill, Summerside, P. E. I.
Dr. Simeon F. Grondin, Quebec, Que.
Dr. M. T. MacEachern, 426 Jackson Building, Ottawa, Can.

The purposes of this Committee are well defined in the following clauses:—

(a) To devise ways and means of bringing all Provincial Medical Associations into closer relationship with the Canadian Medical Association; making the Provincial Associations more helpful to the Canadian Medical Association and *vice versa*.

(b) To assist the Executive of the Canadian Medical Association in matters of adjustment between any of the Provincial Associations and the Canadian Medical Association.

(c) To develop and foster a deeper interest of each Provincial Association in the Canadian Medical Association with the ultimate desire of building up a strong national organization of medicine.

Already the Committee finds numerous ways and means by which these objectives as laid down may be accomplished, resulting in the National Association being of greater service to all the profession of Canada.

If the advancement of the practice of medicine in Canada to-day is to keep pace with Canadian development along other lines, there must be complete and thorough organization functioning to the advantage of all along clearly defined lines, active in its proceedings and rich in its accomplishments for the general good of the profession. With such organization, definite, clear cut and keen, comes better relations and more harmonious working contacts. The Committee has already been impressed with the fact that there exists a considerable degree of healthy interdependence among the numerous organized units, whether provincial or national, and further, they are convinced that there must be established better avenues for interchange, intercommunication and interaction. There is urgent need of coming together in a more co-ordinated and co-operating manner so as to consult more on the various problems and to help each other generally. Mass thought and action is needed in the profession, for the practice of medicine cannot remain local or provincial in nature; the national aspect must always be remembered. Our splendid medical profession of Canada can no more accomplish their best and serve in the highest degree our grand and wonderful country if they continue as isolated individual members or organized units acting along their own specific lines, than could the great army in the recent war had they fought in separate battalions each pursuing its own way without regard for the other. Interdependence, intercommunication, interchange and interaction were a necessity; our army composed as it was of battalions from every province, to obtain its victories had to close up shoulder to shoulder and act as one corps with a brave front to the enemy. Likewise, our medical organizations or units must line up together if we want to be a strong profession, as our traditions demand that we should be.

Needless to say, it is the desire of every medical man in Canada to have a complete national organization, truly representative in nature with well defined functions and a clearly established basis of relations, internally and externally. This organization should embrace all local, district and provincial societies and should be developed along these three lines —

Firstly—The establishment in every province of local or district units or associations, to deal with matters of local concern, scientific advancement, etc.

Secondly—Provincial associations, to deal with matters of provincial or more general scope, and to act as a co-ordinating force amongst the various local units within the boundaries of the province. While some of the provinces are well organized, in others there is still considerable organization to be effected.

Thirdly—The national association, to deal with matters of national concern, to act as a co-ordinating means amongst the various provincial units and to assist organized units of the profession throughout Canada in any of the provinces. The national association should be in a position to serve in any capacity called upon.

The Committee is sure that all this can be accomplished if the support of the profession of Canada is forthcoming. Through such organization, with a field secretary and national headquarters, the service referred to can be rendered. It is expected that a very interesting report will be submitted.

M. T. M.

Prevention of Peritoneal Contamination in Drainage of Abdominal Abscesses.—Two methods of safe drainage of deep seated intra-abdominal abscesses are presented by Joseph Rilus Eastman, Indianapolis. One plan is that of approaching a laterocolic or retrocolic abscess by an entirely extraperitoneal route; that is, the incision is made lateral to the classical appendix incision, and extends only to the peritoneum. The parietal peritoneum is then peeled away from the musculature of the flank, and the abscess opened bluntly at the bottom of the extraperitoneal canal thus formed. The plan is described as follows: About fifteen years ago, in attempting to reach a retrocecal abscess as described above, it was found easily possible to peel off the peritoneum down to a position alongside the cecum; but the exploring finger found no ulcerated area through which a puncture could be made without danger of admitting virulent pus into the free peritoneal cavity. Therefore, the space alongside the cecum was loosely packed with two strands of gauze, between which a large rubber drainage tube was passed, the ends of the gauze,and the drainage tube protruding at the wound in the flank. About eight hours after the operation, the abscess broke spontaneously, and a large amount of pus was discharged from the wound. The gauze was removed gradually, and the tube was taken out after ten days. There were no subsequent signs or symptoms of abscess, nor has there been any recurrence of appendicitis symptoms nor any intra-abdominal trouble of any kind in the years that have lapsed since the operation. Eastman says he has often dealt in this manner with abscesses consequent to appendicitis, and he has been surprised to note how completely this plan of utilizing suction and chemotaxis has removed every vestige of infection in and about the appendix, and how free patients thus operated on have remained, from any postoperative complications.—*Jour. Am. Med. Assoc.*, March 24, 1923.

Eggs as A Source of Vitamin B.—By extraction of egg yolk with water, Thomas B. Osborne and Lafayette B. Mendel, New Haven, Conn., secured a product comparatively rich in vitamin B, the daily dose required for a 100-gram rat being considerably less than that of the most potent dried yeast hitherto examined. The content of the egg yolk in vitamin B is not large, a daily intake of at least 1.5 gm. of the fresh yolk being required when it furnishes the sole source of vitamin B to a 100-gram rat. The whole egg is accordingly not exceptionally rich in vitamin B, when contrasted with other foods already investigated. Judged by the comparative trials on rats, the average sized hen's egg is equivalent in vitamin B potency to about 150 c.c. of cow's milk, or a quart of milk and six or seven whole eggs of the average sort have an approximately equivalent vitamin B value.—Jour. Am. Med. Assoc., February 3rd, 1923.

Editorial Comment

METHANOL, THE NEW NAME FOR WOOD ALCOHOL

Wood alcohol, methyl alcohol and methyl hydroxide are the names by which the spirit obtained by distillation of hard woods has been known. For many years these spirits have been known to the profession as a dangerous poison, a menace to eyesight, and in larger amounts to life. Great numbers of the working class, however, are not acquainted with its toxic properties and as under the term of wood alcohol it is in common use in the arts, it is felt that the name itself may be suggestive, and may induce thirsty workmen to attempt the use of it as a beverage. Ignorant manufacturers also, because of its low price, have made use of it in preparations for internal use. Many casualties arising from its employment in this way have been reported from time to time. In 1892, at the International Conference on Chemical Nomenclature held in Geneva it was decided to discard the name alcohol as applied to it and use in its place the chemical term *methanol.* This name for these spirits was promptly adopted by many of the European nations and was also strongly advocated in the United States by the late Dr. Baskerville. The National Wood Chemical Association of the United States has recently issued a small pamphlet on the subject urging, on the plea of public safety, that the name of wood alcohol be discarded and the word methanol used in its stead. All Canadian physicians will, we are sure, favour this change of name. A.M.

ST. MICHAEL'S HOSPITAL MEDICAL BULLETIN

The second number of this very excellent clinical journal has been received. It is edited by members of the staff, and is an excellent record of the work carried on in the wards and laboratories of a very up-to-date hospital. All the departments are well represented. The group of papers presented in this number are interesting, well written, and will well repay the reader. It is not, however, to the contents that we desire to call special attention in these remarks, but to the fact that the writing and editing of the journal is the work of the Hospital Clinical Society and we commend its objects as stated in an introductory page, to the staff of every hospital in Canada. Weekly meetings are held, with one of the staff as presiding officer, at which interesting clinical cases and specimens from the several wards are shown, so that each interne obtains a comprehensive view of the work being done in the hospital. Cases and specimens are selected for presentation at meetings of other societies, articles are chosen for publication in the journal, and junior members are encouraged and their efforts criticized by the seniors. All the work is encouraged and more or less supervised by the visiting staff, but the members of the house staff are credited with their part in the reporting of the case. Case reporting for journals should be an integral part of a senior interne's training, and when efficiently supervised reflects credit not only on the interne himself, but also on a hospital in which work of a high character is carried on. The publications of many of our important writers in medicine are evidence that the foundation of their success was laid when they were house officers or even senior students, and their early writings were suggested and encouraged by a kindly disposed clinical chief. In the writer's opinion these reports by the interne staff of St. Michael's Hospital represent progress along these lines initiated and stimulated by encouragement from the attending staff.

Of the several objects of St. Michael's Hospital Clinical Society as stated above we desire in closing to emphasize the value of the last one, which reads to encourage junior members to give demonstrations and write articles so that they may gain confidence and experience from the criticism of their friends. This object, if attained, will mean much in the education of young physicians.

The editors of this number are to be complimented on its contents, and on the new spirit which it represents. The staff of St. Michael's Hospital and its Board of Governors are also to be complimented; they have placed before us an excellent example of combined work, which we hope other Canadian hospitals will follow. N.B.G.

Correspondence

A COMMUNICATION FROM THE BRITISH MEDICAL ASSOCIATION

To the Editor.—As I have previously explained to correspondents in Canada it has always been a great source of pride to the British Medical Association that it includes large numbers of the medical profession all over the British Empire, and it has been with great regret that during the past few years we have seen the gradual relaxation of the connection between the Canadian medical profession and the British medical profession, as represented by our Association. We have felt this all the more keenly because we have grown much stronger in other parts of the world, particularly in Australia and New Zealand, and Canada is the only Dominion in which we have held an Annual Meeting. We remember with gratitude the very successful Meetings in 1897 and 1906.

Further, we remember the way in which our Canadian colleagues took their share of the burden during the war and we wonder whether it is really inevitable that the bond between the Canadian medical profession and ourselves shall become less close and finally disappear. We profoundly hope not, and for that reason we have earnestly asked the Canadian Medical Association if steps could not be taken which would provide in some way for a bond between us which, if mainly sentimental, need be none the less useful.

When you ask me to name the terms on which any such affiliation could be brought about, I find myself in difficulties. We have never hampered our Dominion branches as to the way in which they choose to conduct their own affairs and we realize that they need journals of their own to deal with their own doings. But we have always regarded our name—the British Medical Association—and our *Journal* as the great bond between ourselves and our members in the Dominions. Anything else we can offer must necessarily be of a less substantial kind. It occurs to me, however, that the two Associations could arrange for the mutual supply of helpful information, for action in support of one another where professional interests are threatened by lay bodies, for the right of members of each body to take part in the annual or other meetings of the other when they are travelling, and for an occasional meeting of the two bodies in Canada—or in England, why not? We are often able to help our branches in Australia, New Zealand, South Africa and elsewhere by warning members of the profession from taking appointments to which the Association in those parts of the world takes strong objection. You no doubt occasionally have your difficulties with lay bodies who are proposing to employ medical men; you will certainly find these increase as your population increases. Attempts may probably be made to introduce medical men from this country to fill posts which your own men will not accept, and I think you would find we could be very useful to you on that.

Other suggestions will I am sure present themselves: I merely throw these ideas out for you to think over. But I am convinced that we can get no further in this discussion until some of us who believe that there should be a closer bond of union between the profession in Canada and the rest of the British medical profession, get round a table with a view of finding out how it can best be done. In suggesting this I am assuming, of course, the desire on both sides to find a way. I can assure you the desire on this side is very strong.

Dr. J. W. Scane, the Secretary of your Association, of whose illness we are extremely sorry to hear, has told me that owing to the preoccupation of the Canadian Medical Association at its annual meeting at Winnipeg, in 1922, with pressing local business, it was not possible to give serious consideration to this question. We have suggested that possibly the best plan would be for a representative or representatives of this Association to come to Canada and confer with representatives of your Association. The time is getting very short for any arrangement of this kind in connection with your meeting in June, so I would like to suggest that any representatives of your Association who propose to be in England at the time of our annual meeting at Portsmouth, in July next, should be authorized to meet some of our representatives here, talk the matter over and report. Such representatives would be made very welcome.

I am afraid the suggestion of the Executive Committee of the Canadian Medical Association that we should appoint Sir Berkeley Moynihan, Sir Robert Jones, or Sir William Taylor, who are expected at your annual meeting, as an emissary from our Association to discuss the question with your Council, is impracticable. Such a discussion could only take place with advantage between people who are thoroughly conversant with all the constitutional points that may arise, and no one of the gentlemen mentioned has an intimate enough acquaintance with the internal working of our Association to deal effectively with the matter, though I am sure that any of them would be delighted to do anything to draw closer the bonds between the British medical profession in the rest of the Empire and the British medical profession in Canada.

I sincerely hope that now the question has been raised it will be thrashed out with a sincere desire on both sides to arrive at some arrangement which will be beneficial to all of us.

ALFRED COX, *Medical Secretary,*
March 29th, 1923 *British Medical Association*

Harvey as an Art Critic.—An interesting paper on Dr. William Harvey as a man and an art connoisseur was read by Sir D'Arcy Power at the Paris Congress of the History of Medicine in 1921, and has now been published in its *Transactions.* For the most part Harvey's biographers have concentrated upon his scientific attainments, and few have thought of him as a man of like parts and passions as ourselves. Sir D'Arcy Power deals with his human side—with his hobbies and his earlier years. The early Stuart period was marked by a renaissance of art in England. Even in the later years of Elizabeth's reign, art collectors existed, chief among them being the Lord Lumley, founder of the Lumleian lectures at which Harvey was destined to announce his discovery of the circulation of the blood. The fashion spread rapidly under James I. Within ten years of his accession, the Earl of Arundel, the Earl of Essex, the Duke of Buckingham, and Lord Pembroke were buying art treasures in Italy, in Spain, and in the Levant; were commissioning artists like Rubens and Van Dyck; and were employing such agents as Inigo Jones and the Rev. William Petty to advise and help them. Whilst Inigo Jones was studying painting and architecture in Italy at the expense of Lord Pembroke, Harvey was studying medicine at Padua, where he graduated in 1602. Later in life they certainly were acquainted, for in 1655, three years after the death of Jones, John Webb published *Stonehenge Restored* at the instigation of Harvey and Seldon, a work which Jones had left unfinished. Apparently Harvey's residence in Italy had engendered in him a love of the arts, especially painting. The number of portraits for which he sat suggested that he was an unusually good sitter, who was thrown much into the company of artists. In 1636, Harvey travelled in the suite of the Earl of Arundel when that nobleman was sent as Ambassador Extraordinary to the Emperor Ferdinand II. In the course of this tour Harvey was given "a little start" into Italy with "some employment to Mr. Petty about some pictures for His Majesty." The Rev. William Petty was one of Lord Arundel's agents and art collectors, and it is to his artistic acumen that we are mainly indebted for the Arundel marbles. Harvey's journey from Ratisbon to Venice was not without adventure. On the pretence of an irregularity in his passport he was detained at Treviso, whence he wrote angry letters of complaint to Lord Fielding. Lord Arundel heard of his difficulties and wrote to Mr. Petty: "I hope poor Dr. Harvey is with you by this. I received a letter from him yesterday that he has been miserably vexed in the lazaretto at Treviso. I hope he will recover his time lost with satisfying his curiosity, which you will assist him in at Florence and Rome." Of Harvey's energy the Earl speaks jestingly in another letter to Petty: "I hope I shall see the little perpetual movement called Dr. Harvey here before my going." These letters show that Harvey was held in high estimation for his personal qualities, and that so great a judge of men and art as the Earl of Arundel thought him worthy to be entrusted with a commission to buy art treasures at Rome for the King. It is true that the Earl considered Harvey only as an amateur and entrusted him to the care of Petty, who was a professional in the art of collecting. But the correspondence bears out what we knew from other sources—that Harvey in his prime was a genial and lovable little man with artistic taste that ran in the directon of pictures. It is perhaps not without importance to reflect that other great scientific discoverers, notably John Hunter, Jenner, Sir Charles Bell, Charcot, and Pasteur were, like Harvey, men of uncommon artistic tastes. —*Brit. Med. Jour.*, April 14, 1923.

Abstracts from Current Literature

MEDICINE

Blood Destruction During Exercise. Brown, G. O.: *Jour. of Exp. Medicine.*, Nov., 1922, Jan. and Feb., 1923.

In a series of articles the writer reports his observations on the changes in the blood caused by exercise. He experimented with dogs and found that prolonged exercise caused an increase in plasma volume and a drop in cell volume and pigment percentage. There was also an increase in the number of reticulated cells in the blood, thus pointing to bone marrow activity. This increase was at first marked, was followed by a drop in number and then by a steady gradual rise. These phenomena are explained by the theory that the marrow has a certain number of cells held ready for an extra demand, and that these are sent at once into the circulation whereupon the marrow turns out cells in increasing number till the cell volume percentage is restored to normal.

If the animal was transfused after exercise the number of reticulated cells was not increased, the destroyed cells being replaced by the donor's cells and the marrow spared. When the animal was made plethoric by transfusion before exercise there was no increase in the reticulated cells. Exercise seemed to be a definite stimulus to the haemopoetic system. The cause of the increased cell destruction during excercise was not determined, but was thought to be mechanical and due to the quickened circulation.

Dogs that had been kept caged for a long time showed a very marked drop in cell volume and pigment percentage after a period of exercise, but these same animals, when exercised daily, soon showed the normal cell volume and pigment percentage again, showing that a period of training, estimated at about 3 weeks, developed an equilibrium between blood destruction and regeneration.

Autopsies were performed and the dogs that had been exercised were found to have larger spleens and more red marrow in the long bones than in control dogs which had not been exercised.

These experiments show that in sedentary individuals the bone marrow can become sluggish and atrophic, and when unusual exertion is undertaken, it cannot meet requirements, *i.e.* it is in a state of decompensation. By a brief period of training, however, the bone marrow can be so developed that it can cope with greatly increased demands. R. H. M. HARDISTY

Treatment of Diabetic Gangrene. Root, H F.: *The Boston Med. and Surg. Jour.*, Dec. 14th, 1922.

The author cites seven cases treated successfully by operation. He lays stress upon the importance of the *prevention* of gangrene in diabetes, with systematic exercise duly accompanied by massage, and periods of rest. He draws special attention to the presence of minor lesions of a surgical nature, which should be very carefully treated to avoid disease. In this connection, the proper care of the nails and of corns, and the avoidance of cutting them, is emphasized; also the treatment of any infection. It is of the greatest importance to secure proper circulation by elevation of the foot.

When gangrene with infection has arrived, the author recommends prompt amputation so soon as other treatments show no sign of improvement. According to his views, the operation is preferable even when sugar is present, and even with acidosis. Immediately after operation, he suggest a liberal supply of carbohydrates, even as high as 100 grams daily, in the form of oatmeal gruel with skimmed milk, shredded wheat and albumen.

He prefers spinal anaesthesia, but if ether is required, the operation should be as brief as possible. C. F. MARTIN

The Standard of Cure in Syphilis. Fraser, A. R.: *Amer. Jour. of Syphilis*, Oct., 1922.

The author discusses the Wassermann readings and holds to their value in diagnosis, though he considers them unreliable as a guide to the treatment. A slow and progressive sterilization is emphasized in order that the drugs used should stimulate the defensive activity in the tissues, as well as acting as parasiticides.

The treatment should be continued for two or three years irrespective of any Wassermann reading. The author further stresses the importance of treating each patient as an individual, and he regards periodical clinical investigation as a necessity during the rest of the patient's life.

An adequately treated syphilitic may be permitted to marry at once, but the wife of such a syphilitic should be subjected to intensive treatment throughout the period of each succeeding pregnancy. The child, too, he considers should be treated from birth for a period of three years, whether signs of disease are present or not. The Wassermann test in the new-born is unreliable. C. F. Martin

Practical Diagnosis of Heart Insufficiency.

Grassmann, K.: *Munch. med. Woch.*, Aug., 1922.

The author's observations lead him to emphasize the importance of examining the sufficiency of the heart as a whole. Does it respond to the demands of occupation and of general regime? According to the occupation of the individual, so must the treatment necessarily be controlled.

He regards the diagnosis of heart insufficiency in the early stages as a difficult problem. Any one syndrome alone cannot be regarded as positive evidence of insufficiency, and he agrees with Mackenzie's view that the first symptom of insufficiency is always a subjective one. The physical examination may be entirely negative, even in the presence of dilatation, murmurs, etc., and under such conditions it is extremely difficult to differentiate between neurosis of the heart and insufficiency of its muscle.

The methods of Mosler and Schrumpf are commended. Mosler estimates to some extent the degree of insufficiency by taking the blood pressure during quiet respiration and then during a 25 seconds halt of inspiration. When no changes occur, it means that the heart is either healthy or compensation is good. If, on the other hand, the blood pressure rises, the heart is probably hypertrophied but still compensating well. If, however, the pressure falls, insufficiency is on its way. Schrumpf observes frequency of the pulse and the blood pressure in the change from the recumbent to the standing position.

Nevertheless, all these methods are of minor importance in comparison with the history of the case, the adaptability of the patient to his occupation and to various forms of exercise.

C. F. Martin

Benign Albuminuria in the Case of School Children.

Lauener, P.: *Schweiz. med. Woch.*, Dec., 1922.

The term "benign albuminuria" is intended to include all forms unassociated with renal disease, but it is not always easy to distinguish the harmless forms and those due to renal or cardiac disease and infections. The juvenile or orthotic forms probably belong to the group of benign albuminurias without renal lesion. The condition appears at irregular intervals, and the amount of albumin may sometimes be considerable.

The author tested 5,000 school children between the ages of 6 and 16 years. The amount of albumin secreted was measured in each case. Albumin was found in 6.7 per cent. of the younger children, while in the elder children between 15 and 16, albumin was present in 38 per cent.; in large amounts in 3.2 per cent.

This form of albuminuria cannot be considered as connected with puberty as it occurs at a much earlier age. It is more frequent in girls than in boys, perhaps in part due to the presence of inflammatory products derived from the female sex organs. It would appear that albuminuria appears during the period of greatest growth—prior to the actual time of puberty. "Growth albuminuria" is apparently a physiologic-biologic process, and does not imply renal changes, and it is likely that physiological albuminuria in adults is due to a somewhat similar metabolic process.

C. F. Martin

The Etiology and Treatment of the So-called Functional Psychoses.

Cotton, H. A.: *Amer. Jour. of Psychiatry.*, Oct., 1922.

The author deals with his experience in the treatment of these psychoses by detoxication. For the past four years, he has paid special attention to the removal of foci of infection from the functional psychotics at the Trenton State Hospital.

His observations reveal the fact that these patients readily harbour multiple foci of infection, most of all in the teeth. The routine in this hospital includes a very thorough search for foci of infection; the teeth and tonsils are removed, and an autogenous vaccine is sometimes given from the bacteria isolated from the stomach contents. Streptococci and colon bacilli are the organisms most habitually found. The female patients' gynaecological conditions are thoroughly investigated; while in many cases, both male and female, the lower intestinal tract is carefully investigated for possible lesions.

During the past year 1,400 patients have been remarkably benefited, and the recoveries average 80 per cent. of the group of patients discharged as improved. These results are in striking contrast to those of a previous decade, when the average of improvement was 37 per cent. C. F. MARTIN

Damaged Lungs and Bronchiectasis. Riviere, C.: *British Medical Journal*, Jan. 27, 1923.

The author, a well-known authority on diseases of the chest, draws attention in this article to the slight but common forms of bronchiectasis which result from previous affections of the lung. These results he gathers together under the term "damaged lung." He does not concern himself with those uncommon cases of bronchiectasis, described fully in textbooks, with "pints of fetid pus which separates into three layers."

Mild cases of bronchiectasis plus more or less fibrosis often present very anomalous signs difficult of interpretation and are not infrequently diagnosed as cases of pulmonary tuberculosis. They are understood when it is realized that any inflammation of the lung, no matter how slight, may leave behind it a little permanent damage: the lung tissue, air tubes, and pleura do not return to *statu quo* and a mild grade of fibrosis, bronchiectasis, or more frequently bronchiolectasis remains.

Clive Riviere groups his cases into two classes (1) those seen in childhood, and (2) those in adult life. Bronchiectasis or bronchiolectasis may follow simple bronchopneumonia, or that accompanying whooping cough or measles; bronchitis, simple or combined with the two diseases mentioned above or with diphtheria; lobar pneumonia and congenital atelectasis; or finally it may follow upon an attack of influenzal pneumonia or pulmonary tuberculosis, for children *may* recover from pulmonary tuberculosis. After bronchopneumonia in a child the signs often do not completely clear up and such children are prone to have other attacks milder in type, an acute catarrh of the dilated bronchioles with no surrounding consolidation, or a fresh bronchopneumonia. A history of previous disease, the mild course in some cases, and the presence of slight clubbing of the fingers may make one suspect that an attack is occurring in lungs already "damaged."

Most of the cases are basal and then tuberculosis is not so closely simulated, but sometimes an area of impairment with crepitations at the right apex is found and it is then necessary to bear in mind that the right upper lobe is the second commonest site of bronchopneumonia in children, the left lower lobe being the commonest. The children are less ill than with tuberculosis of similar extent and the history and course of the disease should help us to distinguish the lesion from that of pulmonary tuberculosis.

"The child is father of the man" and "damaged" lungs in adults are often the result of inflammation occurring when the patient was very young. The author says he has no definite proof to offer, but is of the opinion that "basal bronchitis," strictly confined to the bronchopneumonia area, is bronchiolectasis derived from a bronchopneumonia in childhood which did not resolve completely and left some damage behind it, but little immediate ill health. Such adult patients may even spit up some blood and it is often necessary to inquire of some older relative before one can learn of an attack of bronchopneumonia years before.

Pneumonia in the recent pandemic of influenza was characterized by the amount of damage done to the interstitial or supporting framework of the lung. On healing, scar tissue formed and pulled, this way and that, on the bronchioles, causing some dilatation here, and narrowing of the bronchioles there. Most commonly this occurred at the bases of the lungs, but, at the apex, many cases were diagnosed as "tuberculosis following influenza.' Finally some amount of bronchiectasis unually accompanies chronic pulmonary tuberculosis and crepitations may remain over diseased areas in arrested or healed tuberculosis.

ARCHIBALD MALLOCH

RADIOLOGY

The Rational Attitude Toward the X-Rays in Diagnosing Digestive Diseases. Brown, Thomas R.: *International Clinics*, March, 1923.

The recent death of Röentgen should not make us oblivious to the fact that his epoch-making discovery has been distinctly a two-edged sword in the digestive field. Dr. Thomas R. Brown, of Baltimore, believes that in the case of a great many physicians, the x-rays have consciously or unconsciously persuaded them to be much less thorough in their careful analysis of the case and in their clinical studies, and this, we feel, is very deplorable, because from x-ray studies alone diagnosis should not, and in many cases cannot, be made. It is to Dr. Brown peculiarly distressing to see a diagnosis founded on very careful clinical study of the case overthrown by a few words from a radiologist, who often is untrained clinically and only too frequently has not had a broad experience in reading x-ray plates. While it is obviously easy to fluoroscope a patient and to take x-ray plates, nothing is more difficult than to explain the pictures on the screen, or to interpret the abnormalities of form or position as manifested in the plates. "I would rather," a celebrated Italian internist said recently, "have no x-ray examination in a case than x-ray plates interpreted by anyone other than a master in this field."

To regard the x-ray as the court of last resort in diagnosis is fundamentally wrong except in gross conditions which can, in the majority of cases, be diagnosed just as definitely by other means. Except in such cases the x-ray diagnosis can rarely be definite; it should only suggest various possibilities the probability of which must be dependent upon other features of the case, as determined by careful history taking, a thorough clinical examination, and the use of various special tests. The x-ray is but one of many means of reaching a diagnosis, none of which except in occasional instances, is capable of furnishing the diagnosis *per se*, but each of which should be used in proper proportion in reaching a probable or, in rare instances, an absolute diagnosis. To show the difficulty even in the hands of experts, Dr. Brown suggests the advisability of having the same case studied under exactly the same conditions by various radiologists. In certain cases all will agree on the diagnosis. These, as a rule, are the easy cases, diagnosable by other means; but in a considerable proportion of cases very different diagnoses will be furnished by different men, all honest, all experienced, all capable in this field. The pictures are definite, the images on the screen are definite, but the interpretation always is a question of subjectivity, and must differ unless the picture is perfectly obvious.

PEDIATRICS

Severe Blood Diseases of Childhood. Poynton, Thursfield & Paterson, *British Journal Childrens' Diseases.* April to December, 1922.

After some general remarks on diseases of the hæmopoetic system and methods for their investigation, to which they do not add anything new, the authors express the view that the next advance in the study of these diseases will come through knowledge of the blood serum and its components, rather than from study of the bone marrow reactions. From the leucocytic reaction to infection, either poly- or mono-nuclear, they suggest that the hypothesis of an infected origin for all the anæmias including the leukæmias as that which is most likely to prove fruitful. They divide their cases into five classes:—

(a) Congenital anæmias; alcoholic jaundice and polycythemia.

(b) Severe anæmia gravis (aplastic) and Von Jaksch's anæmia.

(c) Leukæmia.

(d) Simple anæmia of Chlorotic type.

(e) Lymphadenoma.

(f) Purpura.

The symptomatology, diagnosis and treatment of congenital alcoholuric (haemorrhagic) jaundice is discussed and the differential diagnosis and aplastic anæmia and its apparent similarity to the pernicious anæmia of adults described. It differs from pernicious anæmia of adults in the absence of evidence of bone marrow activity as revealed by pathological sections, and in the white colour of the bone marrow, rather than the usual red colour of pernicious anæmia. According to the author's conception of this disease, it is secondary to some blood poison, infective or otherwise, and from lack of demonstrable cause it is called a primary anæmia.

These workers consider Von Jaksch's anæmia to be a separate clinical entity rather than a severe stage of any infantile anæmia. They require for the diagnosis that the child be under the age of four years, that the anæmia should be severe, that there should be an unusual proportion of myelocytes present in the peripheral blood, and that the spleen should be of considerable size.

These clinicians make some interesting observations on leukæmia in childhood. They point out that a great increase in the total number of white cells in lymphatic leukæmia was the exception rather than the rule, although there is a higher percentage than normal of the lymphocytes. There is also one type of leukæmia in which the white cells are much diminished in number, *i.e.* a "leucopenia" which they term leukanæmia or aleukæmic leukæmia. They regard leukæmia as a peculiar reaction on the parts of the organism to infection, not of a specific nature, which may cause a myeloid or lymphatic reaction.

They discuss cases of acute lymphatic leukæmia, myeloid leukæmia, and mixed leukæmia in which the characteristic blood cells of both the recognized types were present in large numbers; and also lymphadenoma, with general glandular, hepatic, and splenic enlargement accompanied by fever, of, at times, a continuous, later an intermittent type, and a chlorotic type of anæmia in children, which resembles the usual adult picture in the rapid reaction to iron and arsenic.

They conclude that any sharp distinction between myeloid and lymphocytic leukæmia in childhood becomes impossible and further there are unusual cases in which the resemblance to aplastic anæmia and purpura hæmorrhagica is clinically very close. Many severe cases of lymphatic leukæmia show little or no glandular enlargement and little enlargement of the spleen. The cases reported are in children from four months to twelve years of age. The younger the onset the more rapid the course.

These authors report on ten cases of purpura in this article. They divide them into three groups:—

(1) Purpura hæmorrhagica—is the most severe and is associated with internal and external hæmorrhages and high fever.

(2) "Henoch's" purpura is characterized by sudden and recurrent attacks of abdominal pain which may be of great severity .

(3) Cases in which there are subcutaneous hæmorrhages with little or no constitutional disturbance.

These groups cannot be sharply divided, but merge into one another.

The value of rest and warmth in treatment is emphasized. The search for local foci of infection was of little assistance. Special diets have helped only in chlorosis and secondary anæmias. Untoward results from transfusion with citrated blood in two cases, one of aplastic anæmia and one a purpura hæmorrhagica, have caused these workers to abandon this procedure in anæmia gravis, leukanæmia, and purpura hemorrhagica. Splenectomy is advised for alcoholuric jaundice. R. R. STRUTHERS

SURGERY

Lymphaticostomy in Peritonitis. Costain, W. A.: *Surg. Gyn. and Obs.*, Vol. 36, p. 365.

The author has published in a previous article results of experimental work on dogs to show that there is in general peritonitis, fatal absorption through the thoracic duct. In later experiments on dogs, where general peritonitis was produced by ligating the appendix and meso-appendix, the thoracic duct was opened in the neck and drained, resulting in complete recovery of most of the animals.

Later he reports a case of general pneumococcal peritonitis in a child of nine years where the thoracic duct was drained at the neck. The pus in the abdominal cavity disappeared without abdominal drainage and the child made a complete recovery.

His conclusions are: (1) That there is a fatal absorption through the thoracic duct. (2) The elimination of toxin or bacterial absorption from the peritoneal cavity and lumen of the lower bowel cuts short those symptoms which are commonly observed in post-operative peritonitis. (3) The peritoneal cavity has wonderful ability to deal with inflammatory processes when not hampered by absorption. (4) Lymphaticostomy is not in itself a dangerous operation. B. F. MACNAUGHTON

Post-Operative Pulmonary Complications. Cooke, Chas. O. and Pickles, Wilfred.: *The Rhode Island Medical Journal*, Feb., 1923.

This paper is based on a study of 1,000 operations. Thirty-nine cases developed some form of pulmonary complication afterwards. There were fourteen cases of simple bronchitis. In five of these the wound was septic. There were eleven cases of bronchopneumonia of which six were associated with septic wounds. Of the eleven three died, all septic cases. Lobar pneumonia occurred in five patients. It began on the second or third day after operation. Three cases were fatal, all being septic before operation. There were four cases of pulmonary infarction marked by sudden onset, fever, rapid pulse and respiration. There were two cases of lung abscess. Both followed abdominal operations. Hypostatic pneumonia followed two cases of prostatectomy. One in which only local anaesthesia was used was fatal. There were two cases, one of bronchopneumonia and one of lobar pneumonia after the use of nitrous oxide gas and oxygen. Thirty-one of these cases of pulmonary complications followed operations on the abdomen.

There are two principal theories as to the cause of these complications. The first ascribes them to the aspiration of foreign matter into the lung; the second to embolism from the field of operation. The writer thinks that the evidence is in favour of the second theory. He thinks that the number of these complications can be lessened by (1) a reduction in the amount of trauma at the operation, (2) accurate haemostasis, (3) careful control of sepsis, (4) great caution in operating on patients with demonstrable pulmonary disease.

W. B. Howell

COMMITTEE IN CHARGE OF THE FORTY-THIRD ANNUAL MEETING OF THE ONTARIO MEDICAL ASSOCIATION

Chairman—DR. E. R. SECORD, Brantford.
Secretary—DR. T. C. ROUTLEY, Toronto.

Vice-Chairman—DR. P. A. DEWAR, Windsor.
Vice-Secretary—DR. R. E. HOLMES, Windsor.

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DR. C. W. HOARE, Walkerville, Chairman.
DR. W. J. BEASLEY, Sandwich, Vice-Chairman.
DR. H. CRASSWELLER, Windsor, Secretary.

Section of Surgery:
DR. J. W. BRIEN, Windsor, Chairman.
DR. L. G. McCABE, Windsor, Vice-Chairman.
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DR. JAS. GOW, Windsor, Chairman.
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Section of Paediatrics:
DR. GEO. WHITE, Windsor, Chairman.
DR. J. P. AUSTIN, Windsor, Vice-Chairman.
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Section of Eye, Ear, Nose and Throat:
DR. Wm. MacDONALD, Windsor, Chairman.
DR. L. A. DOUGLAS, Windsor, Vice-Chairman.
DR. W. G. G. COULTER, Windsor, Secretary.

Section of Radiology:
DR. J. G. R. STONE, Windsor, Chairman.
DR. R. E. HOLMES, Windsor, Secretary.

Section of Pathology and Laboratory Methods:
DR. S. M. ASSELSTINE, Windsor, Chairman.
DR. H. H. LEES, Windsor, Secretary.
DR. THORNE, Windsor.

Committee on Arrangements:
DR. R. D. MORAND, Windsor, Chairman.
DRS. FRANK ADAMS; BROCKENSHIRE, LANSPEARY, MOODY, WILEY.

Committee on Publicity:
DR. JAS. M. YOUNG, Walkerville, Chairman.

Committee on Entertainment:
DR. H. R. CASGRAIN, Windsor, Chairman.
DRS. CRUICKSHANK, FRED ADAMS, LITTLE, LAING, ST. PIERRE, ROBSON.

THE PRELIMINARY PROGRAMME FOR THE FORTY-THIRD ANNUAL MEETING OF THE ONTARIO MEDICAL ASSOCIATION, TO BE HELD IN WINDSOR ON

May 29, 30, 31 and June 1, 1923

GENERAL NOTES REGARDING THE MEETING

Not since the year 1896 have the City of Windsor and her neighbouring municipalities had the honour of entertaining the O.M.A., and now after a lapse of twenty-seven years the Border Cities, an enterprising and growing centre of industry with ambitions of doubling her population in the next ten years, is delighted to welcome once more the Association. The older members of the profession still in practice, will recall with considerable glee and humour, the former meeting of the Association and the good times they enjoyed at that memorable meet. Your Entertainment Committee under the able direction of Col. H. B. Casgrain, who had command of the entertainment of the last O.M.A. meeting held in Windsor, are planning to excel themselves in making your visit most happy and enjoyable.

Rotunda of Prince Edward Hotel. The Headquarters for the Meeting

Excellent arrangements have been made for golf and tennis enthusiasts. Tournaments in golf will be held at the Essex, Beach Grove and Ste. Clair Clubs. The Elmcourt and Walkerville Tennis Clubs will be available.

The Committee on Arrangements reports that splendid accommodation will be available for all out of town guests. Reservations may be made through the Prince Edward Hotel, Windsor. Write the Manager direct, and do so as soon as convenient.

The Round Table Dinner will be held on Tuesday, May 29th, at 7.00 p.m., in the new Prince Edward Hotel. All members of the Association are cordially invited. This function has become, during the past three years, one of the most interesting features of our meetings. The report of the Committee on Inter-relations will again form the basis of discussion for this year. A real interesting programme is assured. In order that we may set a place for every one each member should advise Dr. Morand, Allen Theatre Building, Windsor, if he hopes to be present.

The Association Dinner, to which the ladies are invited, will take place in the hotel on Wednesday at 7.00 o'clock. This is the one big get-together function of the meeting. Last year the attendance was close upon four hundred. Let us make it five hundred this year. The members of the Association are getting to know each other better. On this occasion, the ladies are the honoured guests. It is hoped they will be present in large numbers. The programme promises to be most entertaining—with some surprises, too. Plan to be there.

On Thursday evening, the graduates of Toronto, Queen's, McGill and Western are to be entertained at the different clubs. Dr. P. A. Dewar will entertain the graduates of Toronto at Essex County Club; while Dr. J. M. Young has extended an invitation to all Queen's graduates to an entertainment at the Walkerville Tennis Club. The Western and McGill graduates are planning reunions.

The Association and its friends are to be the guests of Parke, Davis & Co., at a boat trip, on Thursday, at 4.00 p.m., when refreshments and entertainment will be provided.

Have all mail, telegrams and long distance messages addressed in care of the Secretary of the Ontario Medical Association, Prince Edward Hotel, Windsor, Ont.

Information regarding the parking of cars will be available at the Registration Office.

Green Cross Markers will be available for all motorists. Members are urged to put them up and thus identify themselves among their colleagues.

X-Ray View Boxes will be installed in the Radiological Section. If any one has an interesting plate which he would like others to see, the committee will be glad to have him bring it to the meeting.

The members of the Committee in charge of the Annual Meeting (whose names are herewith presented) and the members of the Essex County Medical Society, under whose auspices the meeting takes place this year, will be glad to do all in their power to make the time of all interesting and profitable while at the meeting. They are prepared to answer all questions about any matter in which they can be of service.

Write the Secretary for any information which is not given in this Preliminary Programme.

NOTE—Informal dress on all occasions

PROGRAMME

Tuesday, May 29th

9.00 a.m.—Meeting of Directors, in Parlor B, Prince Edward Hotel.

11.00 a.m.—Meeting of Committee on General Purposes, which, with adjournment for luncheon, will continue throughout the afternoon. (Parlor B, Prince Edward Hotel.)

7.00 p.m.—Round Table Dinner, Banquet Hall, Prince Edward Hotel.

8.00 p.m.—Round Table Discussion. (Interrelations Committee Report).

Wednesday, May 30th

9.00 a.m.—Registration. (St. Alphonsus Hall).

10.00 a.m.—Business Session of the Association, in Auditorium. (St. Alphonsus Hall)

11.30 a.m.—Address in Surgery—Dr. L. J. Austin, Queen's University.

12.30 p.m.—Luncheon, Prince Edward Hotel. Ladies invited. Hosts—The Rotary Club.

An address will be given on "Crippled Children," by Dr. D. E. Robertson, Toronto.

2.00 p.m.—Sectional Meetings.
Joint Meeting of Medicine, Surgery, Paediatrics and X-Ray.—Symposium on Thyroid, in Auditorium.

5.00 p.m.—Motor Drive along the Banks of the Detroit River.

7.00 p.m.—Association Dinner, Prince Edward Hotel. Ladies invited.
Presidential address—Dr. E. R. Secord, Brantford.

Thursday, May 31st

9.00 a.m.—Sectional Meetings.

11.15 a.m.—General Business Session.

11.30 a.m.—Address in Medicine—Dr. F. G. Banting, Toronto.

12.30 p.m.—Luncheon. Hosts—Chamber of Commerce.

2.00 p.m.—General Session in charge of Department of Pathology, Rooms A., B., and C., St. Alphonsus Hall.

3.30 p.m.—Boat Ride—as guests of Parke, Davis & Co., (entertainment, dancing and refreshments).

8.00 p.m.—Class Reunions.

(Write Dr. Morand, *re* reservations).
(Allen Theatre Bldg, Windsor).

Friday, June 1st

9.00 a.m.—Sectional Meetings.

11.15 a.m.—General Business Session.

11.30 a.m.—Address in Gynaecology—Dr. F. W. Marlow, Toronto.

12.30 a.m.—Adjournment for Luncheon.

2.00 p.m.—Sectional Meetings.

SECTIONAL PROGRAMME

EYE, EAR, NOSE AND THROAT

Wednesday, May 30th

9.00 a.m.—In Parlor A., Prince Edward Hotel. Glaucoma—Dr. Walter Parker, Ann Arbor, Mich.

Extraction of Foreign Bodies from within the Eyeball—Dr. D. M. Campbell, Detroit, Mich.

Hoarseness and its Relation to General Medicine—Dr. Perry Goldsmith, Toronto.

2.00 p.m.—Clinical Significance of Vertigo—Dr. Staunton Wishart, Toronto.

Radical *vs.* Intra-nasal treatment of Chronic Nasal Sinusitis—Dr. Jack Hunt, London

Indications of Operations in Chronic Middle Ear—Dr. Howard Burnham, Toronto.

Asthmas associated with Nasal conditions—Dr. J. C. Calhoun, Toronto.

MEDICINE

Wednesday, May 30th, 2.00 p.m.

Joint Session with Surgery, Gynaecology and Obstetrics in Auditorium, (St. Alphonsus Hall).

Symposium on Thyroid

Thursday, May 31st, 9.00 a.m.

Pituitary Body—Dr. H. B. Anderson, Toronto.

Vertigo and its significance as a symptom in systemic disease—Dr. R. S. Pentecost, Toronto.

Advanced Myocardial Disease—Dr. John MacGregor, London.

Thursday, May 31st, 2.00 p.m.

Joint session with whole convention under Section of Pathology, in Rooms A., B. and C., St. Alphonsus Hall.

Friday, June 1st, 9.00 a.m.

Joint session with Section of Surgery—Differential Diagnosis of Diseases of Upper Abdomen.

Friday, June 1st, 2.00 p.m.

Comments on some Cases of Septicaemia—Dr. Harris McPhedran, Toronto.

Radium—Dr. W. H. B. Aikins, Toronto.

Practical Value of Non-surgical Biliary Drainage—Dr. F. B. Bowman, Hamilton.

X-Ray Treatment in Dermatology—Dr. W. R. Jaffrey, Hamilton.

OBSTETRICS AND GYNÆCOLOGY

Thursday, May 31st, 9.00 a.m.

The Obstetrical Causes and Treatment of Still Birth and early Infant Mortality—Dr. W. G. Cosbie, Toronto.

Haemorrhages of Pregnancy—Dr. Robert Ferguson, London.

Toxaemias of Pregnancy—Dr. John Bell, Detroit, Mich. Discussion opened by Dr. Van Wyck, Toronto.

Thursday, May 31st, 2.00 p.m.

Joint Session of Convention under Section of Pathology.

Friday, June 1st, 9.00 a.m.

Uterine Haemorrhages—X-ray *vs.* Surgical Treatment—Dr. Donald M. Low, Toronto.

Preventative Gynaecology—Dr. W. P. Tew, London.

The use of Radium in Gynaecology—Dr. G. S. Cameron, Peterborough.

Friday, June 1st, 2.00 p.m.

Papillary Cyst-adenoma of Ovary—Dr. Geo. Hooper, Ottawa.

Caesarian Section—Indications, precautions and technique—Dr. G. G. Copeland, Toronto.

PÆDIATRICS

Friday, June 1st, 9.00 a.m.

Feeding Problems of Older Children—Dr. Alton Goldbloom, Montreal.

Rickets—Dr. F. F. Tisdall, Toronto.

Insulin Treatment of Diabetes in Children—Dr. Gladys Boyd, Toronto.

Friday, June 1st, 2.00 p.m.

Acute Intestinal Intoxication—Dr. H. S. Little, London.

Heart Disease in Children—Dr. A. P. Hart, Toronto.

Treatment and Management of Eczema in infants—Dr. Alan Brown, Toronto.

PATHOLOGY AND CLINICAL LABORATORY METHODS

Thursday, May 31st, 2.00 p.m.

Joint meeting of Convention.

The various Sections will be in charge of: Dr. Reed, Kingston; Dr. Morse, Detroit; Dr. Detweiler, Toronto; Dr. Bullard, Kingston, and Dr. Rhea, Montreal.

RADIOLOGY

This section is under the auspices of the Ontario Radiological Society, this being the third annual session of the Society.

Wednesday, May 30th

1.30 p.m.—Some X-ray problems of the general practitioner—Dr. Frank P. Lloyd, Cobourg.

2.00 p.m.—Mechanical Compensation in Pulmonary Diseases—Dr. Bruce Hopkins, Kingston.

2.30 p.m.—Total Effects of X-ray on Growing Animals—Drs. McKibbon and H. E. Schaef, London.

3.00 p.m.—Diverticulae of Gastro-Intestinal Tract—Dr. W. H. Dickson, Toronto.

Thursday, May 31st

9.30 a.m.—Cancer of the Breast considered from the standpoint of Deep Therapy and Surgery—Dr. Rollin H. Stevens, Detroit, Mich., (by invitation).

Bilateral Pyelography with Lantern Slides —Dr. A. I. Willinsky, Toronto.

Condensation of Bone—Dr. A. H. Rolph, Toronto.

1.30 p.m.—X-ray examination of the Heart—Dr. A. W. Crane, Kalamazoo, Mich., (by invitation).

Treatment of Menorrhagia—Dr. Harold Tovell, Toronto.

7 30 p.m.—Annual Dinner of Ontario Radiological Society, followed by lantern slide demonstration.

Friday, June 1st, 9.30 a.m.

The Significance of Appendical Stasis as demonstrated by the Barium Meal—Dr. W. A. Evans, Detroit, Mich., (by invitation).

SYMPOSIUM ON SARCOMA

(A) X-ray Diagnosis of Sarcoma of Bone—Dr. L. R. Hess, Hamilton.

(B) Results of Treatment of Sarcoma by X-ray—Dr. G. .E Richards, Toronto.

(C) Results of Treatment of Sarcoma by Radium—Dr. W. H. B. Aikins, Toronto.

Discussion to be opened by Drs. L. R. Hess and E. S. Hicks, Hamilton and Brantford.

SURGERY

Wednesday, May 30th, 2.00 p.m.

SYMPOSIUM ON THE THYROID—JOINT SESSION

Pathology of the Thyroid—Dr. Jas. Miller, Kingston.

The medical phase of the thyroid—Dr. W. T. Connell, Kingston.

The surgical phase of the thyroid—Dr. A. Moir, Peterboro.

X-rays and Radium in the treatment of Thyroid conditions—Dr. G. E. Richards, Toronto.

Discussion opened by Dr. J. K. McGregor, Hamilton, Dr. Geo. S. Young, Toronto.

Thursday, May 31st, 9.00 a.m.

Cancer of the Breast—Dr. Wallace Scott, Toronto.

Discussion opened by Dr. W. J. Stevenson, London. .

Osteomyelitis—Dr. A. B. LeMesurier, Toronto.

Thrombosis and Embolism—Dr. Angus McLean, Detroit, Mich.

Rectal Fistulae—Dr. A. S. Moorehead, Toronto.

Discussion opened by Dr. Hirchman, Detroit.

Thursday, May 31st, 2.00 p.m.

Joint session under the section of Pathology.

Dr. Rhea, Montreal; Dr. Morse, Detroit, Mich.; Dr. Detweiler, Toronto; Dr. Bullard, London; Dr. Reed, Kingston.

Friday, June 1st, 9.00 a.m.

Joint session with Section of Medicine.

Differential Diagnosis of Diseases of the Upper Abdomen:

(a) Stomach and Duodenum—Dr. H. Bruce, Toronto. Discussion opened by Dr. W. J. Cassidy, Detroit, Mich.

(b) Biliary Passages and Pancreas—Dr. Bevan, Chicago.

Discussion opened by Dr. Angus McLean, Detroit, Mich.

(c) Kidneys and Spleen—Dr. Roscoe Graham, Toronto.

Discussion opened by Dr. R. J. McComb, Toronto.

(d) Ileum, Jejunum and Colon—Dr. E. A. Archibald, Montreal.

Discussion opened by Dr. Geo. Wilson, Toronto.

Friday, June 1st, 2.00 p.m.

Manifestations of General Septicaemia—Dr. Norman B. Gwyn, Toronto.

The Diagnosis and Treatment of Bladder Lesions. —Dr. C. H. Gilmour, Toronto.

News Items

GENERAL NEWS

TYPHOID FEVER AT COCHRANE

THE typhoid fever epidemic at Cochrane, from the information in our possession, would appear to be directly caused by pollution of the town's water supply. The recognized source of supply for the town is from springs. Unfortunately the springs do not yield enough water for the town's requirements, and are quite inadequate to take care of any unusual demand such as a fire. In order to provide for such a contingency the pumps are also connected to Spring Lake, which is an overflow from the springs, but which in addition has a small catchment area of its own. At ordinary times the water level in Spring Lake is several feet higher than the adjacent chain of lakes, which receive the sewerage from the town, but which have a common outlet with that of Spring Lake. Spring Lake and one of these lakes receiving sewerage is connected by a marshy area, through which was cut some years ago a channel to provide an overflow for Spring Lake into the other. During the dry season last fall, and during last winter, the springs proved inadequate to meet the demands of the town, and a considerable amount of water was taken from Spring Lake, with the result that the level of this lake was lowered appreciably, and at the time of the outbreak it was found to be three feet lower than the adjoining lake. At this time it was found that the connection between the two lakes had reversed the direction of flow, and that sewage was actually entering Spring Lake from what had served in former times as an outlet to this lake, the level of Spring Lake apparently having, during the season, altered by nearly six feet, and instead of being 3 feet higher than the adjoining lakes was now lower.

During the summer seasons of 1921 and 1922 the Board had several officers in Cochrane on one purpose and another, and the question of the inadequacy of the present spring supply was urged upon the town. As a result of the Board's warning the town gave its first reading to a by-law on August 1st of last year, providing for an improvement of the spring supply, and for sewage disposal. Unfortunately, the town did not pursue the matter, and the season passed without anything further being accomplished. The Board repeated in its report of November 25th, 1921, the need of a reservoir to store a supply of spring water, and the need of chlorination equipment in connection with the pumping works, so that the supply from Spring Lake could at all times be treated. On March 3rd, 1922, the Board forwarded a copy of its report of November 25th, and urged the immedite purchase and installation of a chlorination equipment.

The provincial sanitary engineer was in Cochrane on Sunday, March 11th, 1923, some days before the outbreak was known to exist. At that time there were some reported cases of diarrhoea arising in Cochrane, although it was difficult to determine from the diagnosis whether this was the diarrhoea of typhoid, or some manifestation of the "flu" epidemic, which was also present at that time. In order to make doubly sure of the water supply, the provincial sanitary engineer called a meeting of the Council on Sunday afternoon, and told them that in view of the situation it would be imperative for the town immediately to install a chlorination device, and after the meeting the provincial sanitary engineer wired one of the Board's engineers to borrow an equipment from the Wallace & Tiernan Company, and to bring it up on Tuesday, and install it as soon as possible. The Tuesday train did not arrive until late Wednesday evening, and it was not until a few days later that the town recognized that they were suffering from an outbreak of typhoid fever. If the pumping engineer had been fully aware of the situation he might have scented danger when he saw the level of Spring Lake dropping in his pump-well. The blanket of ice and snow over the whole area, however, concealed what was taking place. In addition to the equipment by our engineer, another machine was despatched last week to take care of the treatment of an auxiliary supply, which the town was proposing to obtain from Norman Lake. I understand, however, that the lowering of the level of Norman Lake within the last few days has necessitated the abandonment of this supply. The Board, through a request to a local engineer in the municipality for information *re* direction of flow in outlet connection of Spring Lake, was the first body to point out the manner in which the supply had become contaminated. Up till midnight of the 3rd of April there have been 600 cases of typhoid fever with 12 deaths.

The Board has sent to Cochrane on the Mayor's request *two physicians*, 46 *general nurses*, and 10 of our own public health nurses. The latter are carrying on scout and preventative measures among the people, general nursing in emergencies, looking after young children where mothers are ill, and making themselves generally useful. We had four of these nurses in Cochrane for the first ten days and, upon the Mayor's request, and statement that they were doing most valuable work, six more have been sent forward. Miss Knox, Associate Director of the Division, has been on the ground most of the time, and the district officer for North Bay has been there almost continuously.

There is a well equipped emergency hospital of 72 beds on the three floors of Columbus Hall, and a convalescent home has been established next door. The work in Cochrane is in the hands of a very competent local committee, who, I am advised, are doing excellent service. I am in touch with the Mayor by telephone almost every day, and he has been told to advise me of anything he needs. He has expressed his appreciation of the work we have done. The Red Cross has offered assistance, and this information has been conveyed to the Mayor, who is to advise me if they need anything the Society can afford. The fact that a polluted water supply has been shown to be the cause of this severe outbreak of typhoid fever, and that the Council had neglected repeated warnings of the Board in this respect, places a very grave responsibility upon the local corporation.—J. W. F. McCulloch, *Chief Officer of Health, Ontario.*

DEATHS FROM TYPHOID FEVER AND RATES IN THE PROVINCE OF ONTARIO

Year	*Deaths No. of*	*Rate*	*Year*	*Deaths No. of*	*Rate*
1902	392	17.7	1912	483	18.8
1903	391	17.3	1913	446	17.1
1904	482	21.0	1914	358	13.5
1905	446	19.2	1915	298	11.1
1906	891	37.8	1916	335	12.3
1907	520	21.8	1917	252	9.1
1908	662	27.3	1918	208	7.4
1909	669	27.2	1919	145	5.0
1910	706	28.4	1920	203	7.0
1911	637	25.2	1921	213	7.2

CANADIAN SOCIETY FOR THE STUDY OF DISEASES OF CHILDREN

The first Annual Session of the Canadian Society for the Study of Diseases of Children will take place in Montreal in the Mount Royal Hotel June 15th and 16th immediately following the meeting of the Canadian Medical Association. The following papers have already been promised: Acute Intestinal Intoxication by Alan Brown and Gladys Boyd. Acute Hæmorrhagic Pancreatitis, case report, by Alan Brown. Some Phases of Pneumonia by Geo. Campbell. The Diagnosis and Treatment of Laryngeal Diphtheria by H. B. Cushing. Some Unusual Feeding Problems by Alton Goldbloom. Nutritional Oedema by L. M. Lindsay. "Acrodynia" by Crossan Clarke.

The fourteenth meeting of the Montreal Medico-Chirurgical Society was held in the Children's Memorial Hospital, 45 Cedar Avenue, on the evening of April 20th. The following papers or cases, among several others, were presented: Food Oedema by Lionel M. Lindsay; Use of X-ray in the Treatment of Whooping Cough by R. R. Struthers and Norman I. Williamson. Operation for Chronic Empyæma, with presentation of a case by Fraser B. Gurd. Experience with the Open Air Treatment of Disease by A. MacKenzie Forbes. Subcutaneous Irbroid Nodules in Articular Rheumatism, presentation of case and lantern slide Demonstration by H. B. Cushing. Hodgkin's Disease in a young Child by H. B. Cushing Observations on Rickets by Alton Goldbloom.

The American Medical Association Convention will be held in San Francisco from June 25th to June 29th, 1923. The California State Medical Association meets there also on the previous Friday and Saturday and some five or six other National and District Medical Associations have arranged to hold their meetings in San Francisco between June 21st and June 30th. It is thought that many physicians might like to make a holiday trip of it and cross the continent by motor; arrangements are being made for a number of automobile caravans to start from points in the East. The Committee of Arrangements has planned many trips for the visitors who wish to see the natural beauties of mountain, valley, or sea-coast or the evidence that remains of the Spanish regime. Visitors are urged to enter and leave California by different routes so that as much variety as possible in scenery may be witnessed. More extensive trips for those wishing them are suggested: (1) "Twenty-one days to Hawaii and return,"; (2) "Twenty-four day cruise to Alaska,"; (3) "Three weeks' National Park Trip,"; and (4,) "Four weeks in the Canadian Rockies." All inquiries about the Convention, railroad, and other arrangements should be made to Dr. W. E. Musgrave, CaliforniaH eadquarters, 1923 American Medical Association Convention, 806-9 Balboa Building, San Francisco, Cal.

Labour and Doctors.—Organized labour in Toronto has been making representations to the University Committee, of the legislative assembly of Ontario with respect to the qualifications which medical students should have before they are granted a doctor's certificate. The memorial urges that after graduation medical students should go through some form of apprenticeship. It also urges the opening of all public hospital wards to all doctors who have taken a post-graduate course. The memorial also calls for some system to be devised to keep check on the work being done by physicians, so that the doctor who is generally successful may be distinguished from the doctor whose record of mortality is high. "The medical profession," so runs the memorial, "is about the only one which can bury its mistakes." Such are the ideas of labour men regarding the medical profession.

Physical Training For The Young.—Dr. Lamb has done well to emphasize the need of a more general and more scientific physical training of school children. Sixty percent. of Canadian recruits during the late war, he declared, were unfit through lack of physical training in early childhood. Figures such as these shake the foundations of our training system. He justly condemned university methods in which a few athletes are especially developed at the expense of the mass of students. So long as gate-money is regarded as the most important issue in amateur athletics, the universities are not likely to have room for the development of more than one or two highly trained teams. The necessity of coordinating physical and mental education in order to obtain the increase in general efficiency resulting from bodily health appears to be insufficiently appreciated. Greek culture, which has stood as an example for all time, was developed from the gymnasium. Originally intended for the exercise and training of those competing in the public games, gymnasium became consequently the headquarters of medical institutions and philosophic schools; all-round attainments were highly prized and intellectual development was regarded as dependent on bodily well-being. G.H.

NOVA SCOTIA

ANNOUNCEMENT has just been made by Dr. Jost, Provincial Health Officer, of the Appointment of Dr. P. S. Campbell, of Port Hood, as Divisional Medical Officer in the Department of Public Health. Dr. Campbell has frequently contributed papers at the annual meetings of the Health Officers' Association of this province, and has for a number of years followed details of public health administration as a close student. He has had an unusual foundation for public health work and is a valuable addition to Dr. Jost's staff.

AN outbreak of small-pox has been reported to the Department of Public Health in an isolated part of Victoria County, a section of the province without railway, and even without mail communication for a good part of last winter. The infection is said to have been introduced by a man returning from a lumber camp in Maine.

NOVA SCOTIA citizens were given an interesting series of addresses on social hygiene by Mrs. Emmeline Pankhurst during the week beginning April 8th. On Sunday afternoon and evening, mass meetings were held in the Casino Theatre and in the Assembly Hall of the Navy League Building. At the former, Dr. Royer as Chairman, Col. Jos. Hayes and Col. H. A. Chisholm made brief medical references on the subject of venereal diseases. Mrs. Pankhurst followed with an able address. At the evening meeting, Premier Armstrong presided, and made the introductory address, and was followed by Col. Chisholm, after which Mrs. Pankhurst held the attention of the audience for nearly an hour. On the morning of the 9th, Mrs. Pankhurst addressed the Ministerial Association: and in the afternoon a mass meeting for women in the Y.M.C.A., the hall being filled to the limit of standing room. Later, after the election of officers, Mrs. Pankhurst addressed the Social Hygiene Council. The newly elected officers of the Council are: Hon. President, Lieutenant-Governor Grant; President, Col. Joseph Hayes; Vice-Presidents, Mrs. A. I. Mader, Col. E. C. Phinney, Mrs. Pentz; Executive, the above and Mr. J. D. O'Connor, Dr. A. H. MacKay, Dr. B. F. Royer; Secretary-Treasurer, Dr. H. A. Chisholm. Mrs. Pankhurst addressed meetings at New Glasgow, Sydney and Amherst, Col. Chisholm making the preliminary addresses. Remarks on every hand showed the wisdom of bringing this well-trained public speaker to discuss the subject of social hygiene with mixed and special audiences.

THE Faculty of Dentistry at Dalhousie University have accepted the offer of the pre-school age dental clinic at the health centre to have the senior dental students study the work of the paedodontist at her clinics conducted three mornings a week in old Admiralty House.

DR. LYONS who has been associated with Dr. Alan Curry at the posture clinic at the health centre, will develop a clinic dealing with remedial defects, and will also undertake to guide the public health nurses in re-educating the children from whom diseased tonsils and adenoids have been removed, teaching and demonstrating right methods of breathing, correct carriage, etc.

IN March the public health nurses and visiting housekeepers from the various health centre clinics of the Massachusetts-Halifax Health commission made thirty-one hundred and eighty-two visits into a total of twenty hundred and eighty homes. At the clinics some eight hundred and eighty-eight medical and nursing consultations were sought, one hundred and nineteen of them being first visits. Seven of the nurses gave addresses on personal hygiene to various groups of the C.G.I.T., while the executive officer addressed the Gyro and Aurora Clubs, the Engineering Society and Boy Scouts, showing the decline in death rates in recent years.

THE annual banquet of the Halifax Medical Society was held at the Carleton Hotel, April 18th. The officers elected for the ensuing year are as follows: President, Dr. M. G. Burris; Vice-President, Dr. E. V. Hogan; Secretary-Treasurer, Dr. S. J. Turel; Executive, Dr. J. R. Corston, Dr. Angus McDonald Morton, Dr. F. R. Little, Dr. H. G. Grant and Dr. Kenneth A. MacKenzie.

B. F. R.

QUEBEC

Dr. Couillard, director of Lake Edward Sanatorium, gave an interesting lecture on tuberculosis to his Chicoutimi friends.

Dr. A. Ethier, of Montreal, has just returned from a three months' trip to Europe.

Dr. A. Rousseau, Professor of Laval University, is about to leave for a trip to Europe.

Dr. E. Tremblay, of Baie St. Paul, is sojourning in Switzerland; he will visit France, Belgium and Holland.

Dr. J. Benjamin Blouin, Quebec, passed away in March, at the age of 77 years and 5 months.

The Annual Meeting of the *Alexandra Hospital for Infectious Diseases* took place April 11th in the board room of the Bank of Montreal. One thousand two hundred and fifty-three patients were treated during the past year. Of these sixty-eight died. Of those who died, twenty-three were practically hopeless when admitted. Excluding these the mortality for the year was only forty-five deaths, slightly higher than the percentage of the previous year, owing to the severity of the cases of scarlet fever admitted during the early months of the year. During the past year many improvements have been made in the hospital. A central heating plant has been put in and the laundry has been fully equipped to enable it to undertake the increasing work. Two of the wards had been equipped with cubicles, each cubicle furnished with running water and everything necessary for nursing. The financial report showed a heavy deficit owing to the lessened revenue from the city and the increased expenses of the nursing staff.

The report of the *Montreal Maternity Hospital* showed that 1,378 patients had been treated during the year. Of these, 1,239 had been confined and discharged well. Seven had been transferred to other hospitals and ten had died. The main features of the report were the small maternal mortality and low maternal morbidity. Out of 484 viable infants born, 474 were discharged well. Mention was made of the splendid work given by the Paediatric Staff in supervising the treatment of the new-born. Notice was also taken of the pre-natal work carried on in the Hospital.

The medical college and other research buildings of McGill University were visited by a party of Japanese scientists who had been invited to make a tour of the United States and Canada by the Rockefeller Foundation of New York. The party was headed by the Baron Yoshihiro Takaki, chief surgeon and president of the Tokyo Charity Hospital, Dr. Sahachiro Hata, expert in bacteriology and serology, attached to Keio University, and Dr. Keinosuke Miyairi, dean of the medical college of the Imperial University. They expressed themselves as greatly interested in what they had seen and were much impressed with the plans for the new pathological building in the course of erection in close conjunction with the Royal Victoria Hospital.

A Banquet was tendered Dr. Francis J. Shepherd on the evening of the 14th, on the occasion of the fiftieth anniversary of his graduation, by his former demonstrators of anatomy of McGill, and his house surgeons in the Montreal General Hospital. The decorations were carried out in crimson and white, McGill colours. Dr. F. G. Finley, Dr. Shepherd's first Montreal house surgeon, presided. Letters were read from a number of Dr. Shepherd's old assistants and house surgeons, including Dr. Hugh Kinghorn, Saranac Lake; Professor Campbell P. Howard, University of Iowa; Professor Tait McKenzie, University of Pennsylvania; and a cable from

Dr. Ridley Mackenzie, at Paris. Dr. Finley stated that McGill owed a great debt to Dr. Shepherd, who modernized and greatly improved the teaching of anatomy in McGill, so that McGill became recognized as the leading school of anatomy on the continent; in his surgical teaching he brought prominently before his students the practical application of this knowledge. Dr. Bazin, supporting the toast, stated that Dr. Shepherd was not only known as a singularly expert operator, but as a surgeon who had excellent judgment and an almost intuitive power of diagnosis. Reference also was made to the fact that Dr. Shepherd had been associated with the advance of Art in Montreal for almost a generation. He had for a long time been a member of the Council of the Art Association of Montreal, and for several past years been its active President. He was also a member of the Advisory Arts Committee of the National Gallery, in which his critical taste had been of great value to the Committee.

Health Centres in Three Rivers.—Health centres, comprising clinics for tuberculosis and child welfare, will be opened this year at Three Rivers by the Provincial Health authorities providing the necessary co-operation is forthcoming from the town. A grant by the Quebec Government of half a million dollars is to be spent in five years on efforts to lessen the death toll due to tuberculosis and infantile diseases.

Premier Opened Radium Institute.—The new radium laboratory of the University of Montreal, whose existence was made possible by a grant of $100,000 from the Provincial Government, was formally opened by the Hon. L. A. Taschereau, Premier of the Province, who was accompanied by Hon. Athanase David, Provincial Secretary. The inauguration took the form of a meeting, with a demonstration held in the amphitheatre of the University. There was a large attendance of physicians as well as a few lay guests.

Dr. L. J. Rhea, of Montreal, was elected councillor of the Canadian section of the International Association of Medical Museums at the recent session held in Boston. Dr. Maude E. Abbott, of McGill University, was elected Secretary-Treasurer of the Association, with Dr. E. L. Judah, also of Montreal, her first assistant. Papers and discussions on the technique of preserving and mounting medical exhibits occupied the evening session of the convention. Major James Coupal, of Washington, D.C., discussed the Government Exhibit of war specimens, and Dr. E. L. Judah, spoke on special methods of mounting specimens. Dr. Maude E. Abbott, read a paper on the cataloguing of specimens in museums, advocating the decimal system, whereby digits to the right and to the left of the decimal point afford important information on the history of the case. G.H.

ONTARIO

At a meeting of the Norfolk County Medical Society, the following officers were elected: President, Dr. E. W. Zumstein, Delhi; Vice-President, Dr. R. W. Tisdale, Delhi; Secretary-Treasurer, Dr. A. B. Jackson, Simcoe.

The Section of Paediatrics of the Academy of Medicine, Toronto, held a very interesting clinical meeting on Thursday, April 19th, at the Hospital for Sick Children, when the following cases were presented: Spinal Tumour, by W. E. Gallie; Brain Tumour, by Geo. Boyer; Congenital Laryngeal Stridor, by A. P. Hart; Cretinism, by Alan Brown; Thyroid Deficiency, by E. A. Morgan; Exophthalmic Goitre, by M. A. Cox; Xeroderma, by H. A. Dixon; Torticollis, by R. I. Harris; Correction of Deformities following Poliomyelitis, by D. E. Robertson; Lymphatic Leukaemia, by Frank Hassard; Eczematous Ulceration of Cornea, by Chas. MacDougall; Some Aspects of Osteomyelitis, by A. B. LeMesurier.

The Western Ontario Academy of Medicine held its first spring Session on April 7th in the Medical School Auditorium, London, Ont. Dr. L. J. Austin, Professor of Surgery of Queen's University, Kingston, gave an address and clinical talk on the subject of Tuberculosis of the Kidney and Bladder. Dr. A. J. Ochsner, of Chicago, President-Elect of the American College of Surgeons, conducted a clinical demonstration. The cases presented included different Fistulae results of post-operative complications; also a series involving gastro-intestinal diseases. The next meeting will be held April 27th, when Dr. H. S. Plummer will speak on "Diseases of the Thyroid," and Dr. Dean Lewis on "Diagnosis of Bone Lesions." On May 25th, Dr. William Goldie will give an address on "Hypertension," and Dr. Hugh Cabot on "Renal and Bladder Calculi." The aim of the Executive has been to make the meetings international, and have teachers from American and Canadian centres meet on each programme. The interest taken in these meetings is widening in its scope, and there is an ever increasing attendance representing a large part of the Western Peninsula. G. A. R.

BRITISH COLUMBIA

Dr. Cannon has been appointed M.H.O. for Coquitlam.

Dr. Geo. W. Sinclair has removed to New Westminster and commenced practice in that city and in the neighbouring Fraser Mills.

Dr. Bruce Cannon and Dr. Geo. Sinclair have been awarded the medical contract for the Fraser Mills; they follow the late Dr. Robert H. Scott.

Dr. J. A. Sutherland, of Vancouver, B.C., has returned after some months spent in England, during which he devoted his studies chiefly to the subject of Proctology at St. Mark's Hospital.

The last two meetings of the Fraser Valley Medical Society (New Westminster) were particularly interesting. On February 19th, Dr. Manchester gave an interesting paper on Psychotherapy, or "outwitting our nerves." On March 19th, Dr. Pearson, of Vancouver, gave a paper on "Sleeping Sickness."

After considerable discussion between the Management of the General Hospital and the Vancouver Medical Association, a plan for the re-organization of the staff of the Hospital has been arranged. This Hospital, though open throughout to all practitioners in the city, has a considerable amount of charitable work for which a staff is necessary. It is hoped by this re-organization to secure more co-operation and team work as between the various departments.

The Annual General Meeting of the No. 6 District Medical Society of British Columbia (Vancouver Island) was held at Nanaimo on April 6th, when there was a representative gathering from all parts of the Island. Dr. W. F. Drysdale and Dr. T. J. McPhee were unanimously re-elected for a second term to the offices of President and Secretary, respectively. Dr. A. S. Munro, Dr. W. B. Burnett and Mr. C. J. Fletcher, representing the British Columbia Medical Association, were present. Dr. W. B. Burnett gave an interesting address on "Obstetrics" whilst Dr. A. S. Monro outlined at some length the various activities of the Provincial Association, dealing in detail with the present dispute with the Railway Employees' Medical Associations; and also with the subject of "Mine" Contracts on the Island.

Dr. R. W. Irving, of Kamloops, was asked to address the Vancouver Medical Association on "Tick Paralysis" in human beings, a disease peculiar to the dry belt of the Pacific slope. This particular tick, the Dermacentor Venustus, is also responsible for the production of Rocky Mountain fever, by means, it is said, of a parasite, which affects the tick itself. Many ticks are known to exist on the North American continent, but none save this one produces the peculiar paralytic symptoms. These symptoms are remarkable by reason of their widespread character, the rapidity of their onset, and the speed of reversion, when once the provocative cause is removed. Dr. Irving outlined the life history of this member of the Ixodoidea tick family, and referred to the important work done by Dr. Hadwen, late of the experimental farm at Agassiz, B.C., and by Dr. J. L. Todd, of Montreal. He cited particulars of a number of cases occurring in his own practice and in those of nearby colleagues.

Book Reviews

The Gold Headed Cane—By William MacMichael, M.D. A new edition with an introduction and annotations by George C. Peachey, author of the "History of St. George's Hospital." London: Henry Kimpton, 236 High Holborn.

A fifth edition of this medical classic has appeared edited with introductions and annotations by George C. Peachey. Valuable and interesting as the former editions have been, this one apparently has been able to carry still more information in the numerous annotations which Dr. Peachey has so carefully placed along side those of former editions. The short introduction describes the cane and gives a succinct biography of Radcliffe, Neal, Askew, the two Pitcairns and Baillie; in few introductions is so much told and told so well.

Dr. Peachey's own annotations are distinguished by their being in italics. They are numerous enough to double the value and interest of the publication and add enormously to the pleasure of the reading thereof. He has further ornamented the work by the insertion of six splendid plates. The publishers are to be congratulated upon their part. Excellent paper and clear printing prevail throughout. N. B. G

Practical Handbook on the Diseases of Children—By Bernard Myers, C.M.G., M.D., M.R.C.P. 548 pages, with 61 illustrations. Price, 21s. net. Published by H. K. Lewis & Co., London.

This is a general text book on diseases of children. The author, naturally, is only able to give a brief outline of the conditions. The chapters on feeding and nutritional disturbances are poor and not up to date and many of the feeding schemes recommended would not be successful in this country. The more common diseases of childhood such as rheumatism, chorea and heart disease are well dealt with. On the whole, the author has given a very fair review of the diseases of childhood omitting in many instances a discussion of the general principles which are so essential to the student A. B.

Text Book of Pediatrics—Edited by Professor E. Feer. Translated and edited by Julius Parker Sedgewick, B.S., M.D.; and Carl Ahrendt Scherer, M.D., F.A.C.P. 852 pages, with 262 illustrations. Published by J. B. Lippincott Co., 201 Unity Building, Montreal.

This is a most excellent text book in pediatrics, covering the subject in a most thorough manner. Its great value lies in the collaboration of a number of authors, each being an authority in his own branch of the specialty. The etiology, pathology, symptomatology and treatment are all complete, but as short as compatable with their purpose; in fact the book covers the entire subject of diseases of children as completely as do more bulky volumes. Much has been added to the original German edition due to the collaboration of many excellent American authorities and in this manner each subject has been brought thoroughly up to date. A. B.

Nutrition of Mother and Child—By C. Ulysses Moore, M.D., M.Sc., including menus and recipes by Myrtle J. Ferguson, B.S.; 227 pages with 33 illustrations. Price, $2.00. Published by J. B. Lippincott Co., 201 Unity Building, Montreal.

This excellent book should be well received by students, nurses and social workers, as well as by the mother in the home. It is written clearly in non-scientific language. The author commences with a clear delineation of present day knowledge of nutrition and then proceeds to apply it in a simple, practical fashion, dealing with the diet of the mother during pregnancy and lactation. He discusses in great detail the handling of the breast fed infant. Complete diet lists are given for children of all ages, ending with a discussion of the more common mistakes in the feeding of children. The appendix contains an excellent list of recipes and caloric values. A.B.

I Believe in God and in Evolution—By William W. Keen, M.D., Emeritus Professor of Surgery, Jefferson Medical College, Philadelphia. Second Edition. Philadelphia and London: J. B. Lippincott Company.

To have known Dr. Keen was a privilege of the reviewer, hence it is easy to see in this compelling little booklet the figure and activities of that compact octogenarian, who has been one of the guiding hands of American Surgery for fifty active years. The possibility of a belief both in evolution and in a Creator is carefully led up to by resumes from the author's studies in anatomy and surgery and the text and sermon as delivered to the Crozer Theological College, must surely have helped many a graduating and anxious theologian to a better under-

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standing of the old debate. Small as the booklet is, room is found for illustrations in comparative anatomy and surgical procedure which have shown the anatomical similarity between the brains of man and animals; resemblances in other directions are also shown. Sections are devoted to diseases common to animals and man, and to the meaning of "Vestigia" and other such points. Cleric, lay student, scientist may read Dr. Keen's "Credo" with equanimity, satisfaction and approval, according to their several minds.
N. B. G.

Books Received

Smell, Taste, and Allied Senses in the Vertebrates—By G. H. Parker, Sc. D. 192 pages, 37 illustrations. Price, $2.50. Published by J. B. Lippincott Company, 201 Unity Building, Montreal.

Anaemia, Its Causes and Modern Treatment with a chapter on Neurasthenia. By A. W. Fuller, M.D. 64 pages. Price, 3s.6d. Published by H. K. Lewis & Co., London, 1923.

International Clinics—Volume I, Thirty-third Series, 1923. Edited by Henry W. Cattell, A.M., M.D., with the collaboration of Chas. H. Mayo, M.D. 314 pages, illustrated. Published by J. B. Lippincott Company, 201 Unity Building, Montreal.

Inflammation in Bones and Joints—By Leonard W. Ely, M.D. 433 pages, with 144 illustrations. Price, $6.00. Published by J. B. Lippincott Company, 201 Unity Building, Montreal.

Bulletin of the Buffalo General Hospital—Published by the Trustees of the Hospital, Buffalo, N.Y. Vol. I, No. 1, January, 1923. pp. 39.

The New Canadianism, An address delivered by Sir Arthur Currie, G.C.M.G., K.C.B., Principal, McGill University, Montreal, at the Eighth Annual Conference of Heads of Canadian Universities, held at Winnipeg, June 16, 1922. Published by the Canadian Club, of Montreal, pp. 9 to 80.

The Heart in Modern Practice, Diagnosis and Treatment. By William Duncan Reid, A.B., M.D. 352 pages with 32 illustrations. Price, $5.00. Published by J. B. Lippincott Company, Montreal.

Rest and Other Things—A little book of plain talks on tuberculosis problems. By Allen K. Krause, A.M., M.D. 159 pages. Price, $1.50. Published by Williams & Wilkins Company, Baltimore, U.S.A., 1923.

Handbook of Sanitary Law, for the use of candidates for public health qualifications. By B. Burnett Ham, M.D., D.P.H., 9th edition, revised by H. R. Kenwood, C.M.G., M.B., D.P.H. 244 pages. Price, 5s. net. Published by H. K. Lewis & Co., London, England.

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PROBLEMS OF OBSTETRICAL PRACTICE*

W. W. Chipman, F.R.C.S. (Edin.) F.A.C.S., LL.D.

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PARTURITION is a physiological process, identical in the countess and in the cow. At least, until recently, it has been so regarded. Physiological the process is, and yet as regards the countess—and every mother is a countess—this natural process still remains a hazardous occupation. The price of motherhood is still "cruel high": ask any insurance company.

If it is important to be in the world at all, the matter of this entrance, and the price of this admission, are surely of first consideration. And yet, oddly enough, as compared with the sister subjects of medicine and surgery, obstetrics has rather been, not a first, but a last consideration, and it still runs against these a bad third in the race. You will remember that clinical instruction in obstetrics was inaugurated in this country by Dr. James P. White, of Buffalo, as late as the year 1850; so that, in all truth it may be said that adequate training in this important subject indeed got away to a bad start.

Dr. Thomas Watts Eden, of London, in a recent address on "The Maternal Mortality of Child-Bearing," informs us that the average mortality-rate in Great Britain is still about five in every thousand births; and that during the past ten years, this mortality-rate has remained about stationary, showing little or no improvement. The worst of this showing is that only half of these maternal deaths were due to hæmorrhage, and the accidents of childbirth; whereas a second half was due entirely to sepsis. In the registration area of the United States, which represents but two-thirds of the total area of the country, 11,500 women die annually in child-bed, a showing but little better than that in the United Kingdom, while even in this newer and wider country, a full half of these deaths are again due to sepsis.

At first sight, five maternal deaths for every thousand births may not seem a too-unreasonable price to pay; but when we compare this number with the total death rate of some fifteen per thousand of the population, this maternal mortality is at once recognized as, beyond all question, criminal and exorbitant. Put in this way, the case stands strongly against us, inasmuch as these mothers pay a full third of the total price—the mother in the prime of life, the most valuable citizen in the community—dying often from a preventable disease.

The causes of this high maternal death-rate are not "still to seek." George M. Boyd, of Philadelphia, recently tells us that nine-tenths of all mothers in America receive no pre-natal care; that 40% of the women of the United States are attended by midwives or unqualified physicians; that the general mortality in childbirth is second only to that from tuberculosis, in women of this age, and that nearly half of these deaths are due to sepsis. In Great Britain there is the same story, for, despite the pioneer work of the late J. W. Ballantyne, of Edinburgh, ante-natal care is still in its infancy, and more than half the mothers are still delivered by the midwife. Now, these are the facts, and assuredly they carry their own condemnation, declaring in no uncertain terms our national indifference and neglect. For in this way, the expectant mother is left more or less to shift for herself, at the very time when her need is greatest. So left to herself in this great maternal service, one mother in every two hundred comes to make the supreme sacrifice.

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*An address delivered in New York before the Alumni of the New York Lying-in Hospital, March 2, 1923.

As I have said, obstetrics got away to a slow start, and there is still far too much truth in the opprobrium from the general surgeon, that it is safer for the woman in this country to have her abdomen opened for any chronic condition than it is to bear a child. And yet, in all conscience and common sense, obstetrics should run first in this race. Medical science and medical skill should be concentrated here, at the gateway of life, and concern themselves first with what may be called this world-immigration. It *is* of the first importance to be in the world, and well in the world.

It is always essential for us to remember that in 90% of all cases, the labour is spontaneous, and that a vast proportion of these mothers must always be delivered in their own homes. These women cannot come to us in our hospitals and training-schools, but, on the other hand, we of these schools must go to them. We must send to them the well-trained doctor and the nurse, and provide in the home a well-adapted and an efficient technique. So, in a practical, life saving way, we must go to them. This is but another way of saying that we must raise the general standard of our training, must furnish men more thoroughly equipped, and then must devise the ways and means whereby these higher standards may be enforced.

This, in the highest sense, is a missionary service, and a missionary service to the rich and poor alike. Much of it rightly belongs to the Department of Public Health. For the benefit of the poor, maternity centres must be provided, and the doctor and nurse be paid at least a living wage. We are told that to-morrow we die, and it is equally true that we only live again, in this world, in the coming generation; so what is to be said of a Federal Government that spends each year millions of dollars on its agriculture and only the corresponding thousands on its public health. Even in this very city of New York, the largest and richest in America, your Maternity Centre Association lives as yet solely upon charity, and is carrying on this work of maternal welfare until, in the words of Miss Anne A. Stevens, "such time as a demonstration can be made so convincing as to assure for it an adequate appropriation of public money." I say that maternity centres, wherever they are needed must be created, and their physicians and their nurses must be adequately paid.

The cost of such a maternity centre, properly manned and equipped, is not so great after all, even though in a national sense, it is such an important proposition. At the Maternity Hospital Centre in Montreal, Dr. J. W. Duncan, the physician in charge, tells me that the actual cost of the home delivery, per child, was last year nine dollars and fifty-one cents. At the same time, the amount collected from the mothers averaged six dollars and seventy-two cents, thus leaving a debit balance of two dollars and seventy-nine cents, as the monetary loss to the centre, for each child. Overhead charges were, of course, not included here, and the skilled obstetrical service was purely voluntary.

Everyone will admit that the child is our greatest national asset. Irving Fisher tells us that each one of these new-born is worth, in potential earning power, some ninety dollars to its community; so that, even with maternity centres, and with all salaries and all charges paid, the transaction still remains a richly-paying proposition. And all this is not Utopian; it could easily be applied both to our urban and to our rural districts, and it is strictly business, and good business if it comes to that.

Our own immediate share in the transaction—the share of our hospitals and our training-schools—is, as I have said, to provide the men. These men must have a sound general knowledge of medicine, and a special training for this work. And this training must be made broad, practical, and sufficient, if we are to ensure a general improvement in our obstetric art.

Now, if our obstetric practice is to advance at all, it must be along the lines of preventive medicine; and this progress we may define in the following terms: (1) A definite antenatal care; (2) A hospital segregation of the complicated cases; (3) A simple, efficient technique during labour; (4) A post-natal care.

These, I take it, must be the main lines of our advance, and although it all sounds so simple, it really means that the obstetrician must be a master of his subject.

(1) *A Definite Ante-natal Care*—Such care demands both a general and a special knowledge, and means much more than mere pelvic measurements, and a periodic examination of the urine. It must include a general examination of the patient early in her pregnancy, a careful ante-natal supervision, and a thorough knowledge of the pathology of the pregnant state. There follows then the special examination of the mother and the child at the 30th week, when this child is viable; and the early recognition of the complications which may beset them both. There must also be included a good working knowledge of general hygiene and of public health. Here, as elsewhere, it is "woe unto the specialist who is not also a fair generalist."

(2) *A Hospital Segregation of the Complicated Cases.*—Though I am no special optimist, I believe that these hospitals will, in time—not in eternity—be provided. In the cities and the older countries, the problem is an easy one, but it becomes possible with our modern transport, even in the newer countries, and with a scattered population. In these hospitals, so far as may be, the various complications, such as the probable dystocias, the toxæmias, cases of ante-natal hæmorrhage, and puerperal sepsis. (when it does occur) are to be segregated and all the advantages of a hospital service made available in their treatment. Very fortunately for us all, these obstetrical complications, where there is adequate ante-natal supervision, give abundant warning of their presence; the sudden, unannounced emergencies are very few, and the good obstetrician is thrice-armed, in that he is fore-warned of the event.

(3) *A Simple, Efficient Technique during Labour.*—The prevention of infection is the most urgent problem in obstetrics: it is far more important than operative skill, where 90% of the labours are spontaneous. As we have seen, puerperal sepsis is responsible for as many maternal deaths as are all the other complications put together; accordingly, the first and the most important part of our training is to prevent this sepsis, to furnish the young obstetrician with a good technique. This technique must be simple, must be adequate, and, among the poor, inexpensive; adaptable it must be, and everywhere consistent. Eden happily designates such a simple technique as the "irreducible minimum," and rightly contends that our hospitals should teach in this regard, not only by precept but also by example. One of the dangers of a hospital technique is that it tends to become too elaborate, and too far-removed from the possibilities of private practice.

In our maternity centres in Montreal, this "irreducible minimum" can be expressed in the following concrete terms. There are to be two night-gowns, four sheets, four pillow-slips, four towels, freshly laundered, and provided, where possible, by the patient. The obstetrical kit from the maternity centre includes the following sterilized equipment:—a gown and rubber gloves, patient's leggings and vulvar pads, cord and eye dressings, and a few necessary instruments; to these are added two rubber sheets, a douche can, and two granite-ware basins; lysol, biniodide of mercury, and tincture of iodine are the only antiseptics. Now, with these things, a cake of fresh soap, and boiled water, an irreproachable technique can be attained. All the rest depends upon the personal equation, and the correct application of these simple equivalents.

As regards obstetrical procedure, the one important rule is that the parturient vagina should be entered with the same respect as the peritoneal cavity. Abdominal palpation will reveal, not only the presentation, but also the position of the child; the dilatation of the cervix may be learned per rectum, and the heart-rate truthfully indicates the condition of the child. A vaginal examination should only be made for good and sufficient reasons, and with the greatest observance of respect.

This rule also carries with it the definite obligation of operative restraint. The ideal delivery is, and must always be, the one that is spontaneous: for, when all is said and done, it is the safe delivery, and in consequence, the ideal to aim at. In a given series of cases it can be shown that the morbidity rate is increased, comes to read as 7 to 4, by an operative interference: and this fact finds its best illustration perhaps in comparing the exhibition of half a cc. of pituitary extract with delivery by low forceps.

(4) *A Post-natal Care.*—Even as ante-natal care is preventive obstetrics, so the post-natal care may be described as preventive gynecology. The puerperium is an important phase in the gestation-cycle, and the involution of the genitalia is a definite process to be carefully safeguarded. At least one post-natal examination must be made, preferably at the 4th week; any trauma, disability, or sub-involution are to be noted, and prompt measures taken for their relief. It goes without saying that operative measures are to be postponed, if possible, till a lactation-term is accomplished. In this way we see to it that the genital tract is speedily restored to health, and we ensure for the woman a freedom from future suffering and disablement.

This, then, is the general problem of our obstetrical practice, and it is the first and the most urgent problem that confronts us. It is always a wise thing to begin at the beginning, and the true solution of this problem is to improve the general standard of our teaching, and so to provide both men and women who will be efficient in this work. In all obstetric practice there are the two outstanding requisites: the one, the "masterful inactivity" of the well-trained and capable man: and the other is the universal employment of a good technique. It of course goes without saying that in this attitude of "inactivity," the obstetrician must always be a master of the situation; and so it is that a sound surgical training is essential, and, added to this, a sufficient skill and experience.

Accordingly, our hospital training should be conducted along these lines, and should not become in any way distracted from the actual needs of the situation.

And yet there is a tendency, I confess, to such distraction. Brilliant surgical interference rather tends to captivate us, and to divert, or even to misdirect, our main attention. The induction of labour in normal cases, and the obliteration of the second stage by version or prophylactic forceps, do not herald an obstetrical millenium, even though they may be performed by any dextrous surgeon. They are at first sight spectacular and dramatic, and therein is their danger, for they are not safe for general application. In a sense, they provide for the woman a vicarious labour, inasmuch as the obstetrician takes upon himself the main delivery. In very truth, it may be said "he labours" for her. No, this may be brilliant, but it is not safe obstetrics, and disastrous indeed, would be the result if these procedures were generally employed.

I shall now consider four special problems in obstetrical practice, merely enunciating here the general teaching which we adopt. The methods that I advocate are for the most part old and well-tried, for they stand us still in good stead. They are, moreover, safe teaching methods, and they may be applied, both in the hospitals and in private practice.

These four problems are the following: (1) the occipito-posterior position; (2) eclampsia; (3) placenta prævia; (4) puerperal infection.

1.—*The Occipito-posterior position.*

Some idea of the frequency of this position may be gathered from the following figures. Last year, in the Montreal Maternity Hospital, there were 1230 confinements, and in 51 of these, the occiput was in the posterior position. Oddly enough, the number of the right and left positions was practically equal, for there were 26 of the one and 25 of the other. In these 51 cases, there were 22, or nearly half the number, in which the labour was spontaneous. Of these spontaneous cases, in 8 good flexion was preserved, and the occiput underwent the long, forward rotation, while in 14 there was loss of flexion, the occiput remained posterior, and the delivery was a face to pubes.

The remaining 29 required assistance. This took the form of a manual rotation of the head, followed by low forceps in 13 cases. Here the rotation was brought about by flexing the head by pressure upon the sinciput during a pain, and a manual rotation, the forceps only being applied when this rotation was complete. In 15 cases, this manual rotation failed, and mid forceps were required. In these, the blades were applied laterally to the head, and simply by downward pull the occiput undertook of itself the rotation forward. A second application of the blades was necessary after this rotation had occurred, to deliver finally the head. In 14 of these cases, the occiput led in the rotation, and the forceps' blades were simply allowed to follow in this movement. In only one case was a definite Scanzoni, that is, an induction of the rotation by the blades themselves, found necessary.

A median episiotomy was done in all the face to pubes cases, and in but two of these was the spincter ani muscle torn through. In them all, repair was satisfactory; in only one case was the puerperium morbid, while there was no mortality among the children.

Now, in all fairness, these results are satisfactory, albeit the methods pursued represent a minimum of interference. Though it is possible, in many instances, to identify these posterior positions by external palpation, before, or at the beginning of labour, it is probably safer to leave them alone. A version is scarcely necessary, save there be some pelvic contraction; and the same may be said of Buist's external rotation of the anterior shoulder, or the internal rotation of this same shoulder by the excellent manoeuvre of Pomeroy.

2.—*Eclampsia.*

This eclamptic condition will rarely develop if there be adequate pre-natal care. It can largely be checked by starvation, as witness the results in the Great War. Now and then, however, we meet the fulminating case—the convulsion is like a bolt from the blue—and there are many cases where there has been little or no supervision.

Last year we had 14 such cases of eclampsia, and in only one of these did the mother succumb, and this from a broncho-pneumonia on the 17th day after her delivery. In 7 cases the labour was spontaneous, in one the patient was admitted post-partum, and in the remaining 6, the labour was later induced by the Champetier de Ribes', or the Vorhees bag. In none of these cases was a Cæsarean section undertaken. Six of the children were premature, and of the full-time children 4 were dead-born. In all, 8 children survived and two of these were twins.

I believe it is wise in these cases to treat the eclamptic condition, leaving the labour to care for itself. In my judgment, the definite routine of immediate delivery is a great mistake. Rather shall we first treat the actual eclamptic condition, and in the following way.

There is no doubt whatever that convulsions kill, and in consequence these must be controlled by a free use of morphia. One-quarter of a gr. is first given hypodermically, and this is repeated, if necessary. If possible, a specimen of urine is secured, to verify the diagnosis in the emergency case. A venesection is done, and sufficient blood removed to reduce the blood pressure to a normal reading, say 130. The stomach is washed out with a solution of bicarbonate of soda, and one oz. of magnesium sulphate, in a saturated solution, is left in the stomach; the rectum is emptied, and this is followed by high-colon lavage, with the same alkaline solution. Hot packs were not employed, though the Burdick's electric bath was used in several of the cases.

Under this treatment the condition of these 14 patients gradually improved; consciousness was regained, the fits ceased, and the flow of urine was re-established. Forced fluids were administered by mouth, and per rectum; and in 3 of the most severe cases, 10 oz. of a normal glucose solution was given intravenously for three days. All these patients recovered, save the one who died later of broncho-pneumonia. This recovery was always gradual, a matter of days in each case, and it was denoted by a controlled blood-pressure, a steadily clearing consciousness, an increased output of urine, and the diminution therein of the albumen and casts.

As I have said, in 7 of these cases, labour spontaneously supervened. The remaining 6 improved so far, and then failed to establish a further improvement. So soon as this maximum improvement was reached, as indicated by blood-pressure, urine findings, eye-grounds, and general condition, the labour in each case was induced.

The results in the 14 cases were that 13 mothers and 8 children survived; and so I conclude that the above was not an unwise procedure in these cases.

It was interesting to observe that in these improved cases, a mild eclamptic condition was always induced by the labour. This was occasioned no doubt by the heightened metabolism and the additional toxæmia, consequent upon the strain of labour; and added to these, the necessary anæsthetic. In no case did actual fits occur, but the condition was pronounced enough to convince one of the wisdom of the delay.

3.—*Placenta Praevia.*

In the present series, the placenta was prævia in 8 cases, all multiparæ, but in only 2 was the implantation central, or nearly so. In one, it was marginal, and in 5, lateral on the lower uterine segment. In 6 of the cases, pregnancy had reached term, as nearly as could be estimated; while in the other 2, the thirtieth week was about its duration. Two of the children presented by the breech, and in all the others the presenting part was the vertex. In 3 of these vertex cases, on their admission to hospital, the cervical canal was sufficiently dilated to permit the immediate introduction of the hand, and the performance of a podalic version; and it was in two of these that the placenta was centrally placed. In the other 3 vertex cases, there was but little dilatation, and a bag was employed and used in the intraovular position. The breech presentations, on admission, revealed a cervical canal the size of a finger. A manual dilatation was immediately performed, the membranes ruptured, and the anterior leg was brought down into the vagina. In one of these cases, the mother was practically exsanguinated on her admission, and her child was dead. Though the bleeding was immediately controlled by the above manoeuvre, despite all stimulation, intravenous and otherwise, she succumbed, in two-and-a-half hours after admission.

Of the children, 4 were lost, and it is only fair to say that 2 of these 4 were premature.

The total result of this small series is that in the 8 cases, 7 mothers and 4 children survived.

In respect of placenta prævia, the following rules are to be observed.

(1) This first rule concerns itself with diagnosis. If a uterine hæmorrhage occurs during the last trimester of pregnancy, and be not associated with uterine pain, there is probably a low implantation of the placenta. If the blood-pressure be not elevated, and there be no albumen or casts in the urine, this probability is strengthened, though an actual diagnosis can only be made by means of a vaginal examination. If the placenta occupy the lower uterine segment, it can usually be felt as a definite sponge-like structure, underlying the presenting part of the child, which in consequence, lies unusually high, and is frequently somewhat laterally placed. The vagina appears long, the cervix is reached with some difficulty, and the lower uterine segment is thick and vascular.

(2) Now, given a single uterine hæmorrhage, and this diagnosis made, there is no doubt that the sooner delivery is effected, the better. Successive hæmorrhages tend to increase in severity, and even in hospital, assistance is not always immediate.

(3) If the implantation be central, or nearly so, and the child be alive, either at term or viable, I believe that a Cæsarean section in multipara and primipara alike, is the wise procedure, provided always that good surgical conditions can be secured.

(4) In private practice, where rubber induction-bags are seldom available, a firm gauze pack in the vagina, the application of an abdominal binder, and a hypodermic of a sixth of morphia, will ensure a period of safety, in which extra help may be procured, or the patient be moved to hospital. If delivery must be undertaken in her own home, this vaginal pack is invaluable. By its means, the hæmorrhage may be controlled, using, if necessary, successive packs until sufficient dilatation of the cervical canal be secured. The membrane may then be ruptured, and the descent of the presenting part promoted by means of an abdominal binder; or a podalic version be immediately performed.

4.—*Puerperal Infection.* — This is a wound infection, for the puerpera is a wounded woman —wounded, mainly, at the placental site. The organisms are chiefly the hæmolytic strains of the streptococcus, though in rare cases the staphylococcus is the causative agent. These organisms are present everywhere, on skin and mucous surface, where they exist as saprophytes; and they are specially numerous in the region of the vulva and perineum. For this perineal abundance, Victor Bonney blames the anus, and contends that its propinquity to the birth-canal represents a grave defect in our development. He mourns that there is no likelihood of any immediate change in this arrangement. These organisms may be resident in the vagina, even of the healthy parturient, though the abundant secretion, its acid reaction, and an acquired specific immunity, tend to speedily attenuate their virulence.

In each and every case the greatest danger is always from without, and with fresh strains —stranger ones, of these organisms.

As we all know, these facultative saprophytes, are a menace only when there is a recent wound, for then they may become a parasite, and acquire sufficient virulence to make them pathogenic. Objectionable aliens they always are, and are never to be trusted. Innocent here and to-day, and virulent there and to-morrow, they are the cause of many wound-infections, the severe types of peritonitis, of erysipelas, and they seriously complicate, to say the least, the throat conditions of diphtheria, measles, and scarlet fever. Transferred from one individual to another, they frequently gain exalted virulence, so that, in merely swabbing a mildly infected throat, or in dressing an infected finger, the expectant mother may, by so doing, sign her own death-warrant.

Accordingly, during the final weeks of a pregnancy, there is need of a careful prophylaxis. So far as may be, the mother must be protected from all sources of infection; in particular, she should be isolated from all zymotic disease. There should be special cleanliness exercised about the vulva and perineum, and there must of course, be no sexual intercourse whatever.

As I have said, the place of greatest danger is from without, and now the time of greatest danger is at the time of labour. If, as a result of careless vaginal examination, or operative interference, these organisms are implanted within the vagina, they may soon infect a cervical tear, or even a placental site, while these wounds are fresh, and still unprotected by any reactionary tissue. The most dangerous time is the first 48 hours, for then these wounds are most vulnerable, and the woman's sole protection is the flow of fresh bactericidal blood, and the pregnancy leucocytosis. This, then, is the time of greatest risk, and the danger always is the untimely entrance of these organisms into the wounded zone.

Credé puts the case well when he says: "Limit as far as possible puerperal wounds, be restrained and gentle in all manipulations, and do not infect these wounds, or permit them to become infected." And so we are brought back again in the conduct of any labour to the "masterful inactivity," and the good technique.

The management of a third stage is also of first importance. This third stage is a miniature labour, and like the larger labour must, if possible, be spontaneous. After the expulsion of the child, the uterus is fatigued, and ample time must be given in which it may retract and recover. Its tone and its activity must in a measure be restored before it can undertake the separation and expulsion of the placenta, and the timely control of the hæmorrhage by a sufficiently firm grasp of the vessels. This time varies greatly in different cases, so one must not be mindful of the clock, since the uterus itself is the only trustworthy timepiece. It is always correct, always tells the right and proper time, by manifesting its strong and regular contractions. Post-partum hæmorrhage is more often the fault of the too-impatient physician than of the too-patient uterus. Moreover, a premature Credé may raggedly separate the placenta, and a cotyledon, or large portion of the membranes, be left behind, with all the consequent risks of hæmorrhage and infection. Such a hurried, and so incomplete emptying of the uterus, undoubtedly explains the relationship that exists between the length of this third stage and the number of the organisms, and the time of their appearance within the puerperal uterus. As you know, the puerperal uterus is usually sterile only for the first 48 hours after delivery. The investigations of Ahlfeld and Walthard have shown that in a given series of cases a uniformly short third stage implies frequent manual assistance, and that in these cases this uterine flora appears earlier and is more abundant; that measured in terms of time, a third stage, approaching an hour in duration is safest in this respect, and is in consequence, more likely to be followed by a non-morbid puerperium. The lesson here again is to wait in each case for the uterine recovery, and save for good and sufficient reasons, never hurry the third stage.

A careful inspection of the secundines is imperative, special attention being paid to the cotyledons, and to the margin of the placenta for the presence of torn vessels—the evidence of a succenturiate lobe.

Now, all this is prophylaxis, and we cannot sufficiently emphasize its importance, since in every case the proper treatment of child-bed fever is to prevent it. And yet, even in the best-regulated clinical families, it does occur. Last year, in the Montreal Maternity Hospital, with its 1230 deliveries, there were in all 10 deaths—a mortality rate of 0.81%. Seven of these deaths occurred within 24 hours of admission, and of these, 2 were admitted with a ruptured uterus, one with a pleural empyema, one with an eclamptic toxæmia, 2 with a myocarditis and failing compensation, and one was an exsanguinated placenta prævia.

There were two deaths from puerperal infection. In one, the labour was spontaneous, only a rectal examination was made, and yet the patient died on the 9th day from a streptococcic infection, and we were altogether unable to account for its occurrence. In the second case, a Cæsarean section was done in a severe toxæmia, and though the child was saved, the mother died on the 4th day from a septic peritonitis.

The morbidity rate, during the same year—measured by the high standard of a single rise of temperature from any cause, to 100.6F. during the 12 or 14 days' stay in hospital, was 19.1% . It is only fair to add that in nearly half of these cases, *i.e.* in 8.5% the fever was due to extra-genital causes.

And now, *the Treatment.* Here there still remains a sharp divergence of opinion. The whole problem is in the nutshell of whether to enter, or not, the infected uterus.

Our own rule in these cases is this: if the case has been delivered under our own care or supervision, and we are in consequence reasonably sure that the uterus is empty, we never enter an infected uterus, save for the control of hæmorrhage. It is never safe to break through the reactionary zone in any septic wound to attack the infection, as it were, from behind; and, in this uterine situation, we cannot attack it in front. Accordingly it is much safer to make no local attack whatever.

To this general rule of non-interference, I am willing to concede the following exceptions. If the case has been seen only post-partum, and the history of the third stage be indefinite as to a perfunctory examination of the secundines; if the clinical findings bespeak something retained in utero; namely, a foul and abundant lochia, a large, soft, movable uterus, a patulous internal os, easily admitting the finger, at, or after the 4th day, and the fever be intermittent in type, it is permissible, I believe, to enter the uterus, but only with the finger, and to remove therewith any considerable placental fragment. A uterine curette, sharp or blunt, is never used, and even an intra-uterine douche is never given.

There is then, generally, no local treatment, though good uterine drainage is secured by the Fowler position, the ice-bag over the fundus, and the exhibition of hydrastin, or of ergot and strychnin.

If the infection be severe and systemic in type, 90 cc. of the polyvalent, antistreptococcic serum may be administered, at one time, but in divided doses. The hope is that the strains correspond, and that a beneficient adsorptive neutralization of the toxins be so brought about. Vaccines have no place in these acute cases, for the patient is already more than sufficiently vaccinated. An attempt may be made to stimulate the resistance of the patient, to awaken or increase the non-specific anti-bodies, by the intravenous injections of various chemicals, or of animal, or vegetable proteins. Nucleic acid is one of the latest of these. Long ago, Credé began with formalin and collargol, and the name of the re-agents is legion. Dr. H. C. Burgess, one of my colleagues, has great faith in eusol:—2 oz. of a carefully titrated solution being added to 10 oz. of normal saline, and given intra-venously, every second day. I have never been able to convince myself that any of these substances have any specific value, or that they are superior in any way to a plain glucose solution, a saline solution, or even distilled water.

The *general treatment* is summed up in the following directions. Feed the patient, and force the fluids by the mouth if possible, and where necessary, by the rectum. Secure an abundance of fresh air, and, above all, satisfying sleep.

Mr. Chairman, may I thank you, and the Alumni of this great hospital, for the honour of speaking before you. We are all engaged together upon this great service,—the prevention and the cure of disability and disease. In a true sense, our hospitals and our training schools must be the "proving grounds" of clinical experience. What is found good, we select and teach, holding fast only to that which is true.

At the same time, our duty is to advance our knowledge, and to encourage research; for we remember that it is only with a right conjunction of special thought with action or science with art, that we can become a growing-point—a growing-point in our profession.

Our special service is to provide, as near as may be, a universal Yea, to the mother and her child: "Is it well with the child?" And, by reason of our service, the mother herself may make answer, "With myself and my child, it is well."

THE FOOT—A CLINICAL LECTURE

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During the first two years of life the most important lesion is the *congenital club foot or equinovarus*, presenting the familiar picture of the foot turned inwards and the heel drawn upwards by the shortened tendon of Achilles. Treatment of this condition should be instituted from the moment the child is born; and as follows:—after a swift but vigorous wrenching to correct the deformity, the improved position is maintained by adhesive plaster strapping extending as high as the knee. Care should be taken that the strapping be not applied too tightly, and one should be contented with slow but steady progress. This procedure is repeated every fortnight, and after four to six months it will be found that the foot can be placed in a corrected position with little or no effort. The strappings are now applied seldom or not at all, and when the baby begins to stand his little boots should have their outer borders raised one-quarter inch. Occasionally one meets a case where considerable toeing-in exists, owing to a twist of the tibia and fibula. Here plaster-of-Paris is necessary, applied from the toes to above the flexed knee with the foot strongly everted. One or two such applications at an interval of six weeks will usually suffice. A baby born with noticeaby *flat feet*, should have these wrenched and strapped in inversion, exactly the reverse of club foot.

In childhood between the ages of two and fourteen one frequently meets with cases of 1.—Flat or pronated feet; 2.—deformities due to poliomyelitis; 3.—tuberculous and syphilitic arthritis; 4.—Uncured congenital club foot; 5.—Still's disease, a polyarthritis of childhood.

(1) *Flat or pronated feet* are generally acquired by bad habits of walking and standing. Rickets and congenital defect are also frequent causes. Mild cases should be treated by raising the inner side of the soles and heels one-quarter to one-half inch, until the inner ankle is no longer prominent. In this way the body weight is borne on the outer and stronger side of the foot. The child should be encouraged to toe in when walking or standing, and should not be permitted to go barefoot or in running shoes. When the child is old enough foot-strengthening exercises should be taught. Where the deformity is so extreme as not to yield to this simple treatment, a light brace is used extending from the boot heel up the outer side of the leg to below the knee. The ankle is then pulled towards the iron upright by bandage or strap, overcoming the deformity. This should be worn for months or years until improvement has been obtained and milder measures will suffice. Attention to these details will give a good foot in most cases, though it may occasionally be necessary to carry on the treatment for many years. It may be well here to draw attention to the flat foot, usually rigid, which appears after a blow or sprain and which, after a month or two, manifests the swelling and tenderness of tuberculous arthritis.

In an advanced grade of flat foot in children over eight years one may practice the astragalo-navicular arthrodesis of Ogilvy, which has yielded excellent results. The operation is followed by four or five weeks fixation by plaster-of-Paris of the foot in an inverted position.

(2) *Paralytic deformities.*—These are of all kinds, usually the result of infantile paralysis, though spastic conditions are not rare. Up to

the last few years such deformities contributed largely to the well-being of the brace maker. Thanks to the comparatively recent adoption of arthrodesis in conjunction with tendon transfer, crooked feet of almost all kinds can be made to remain straight without the need of artificial support.

(3) *Tuberculous arthritis.*—This usually follows a blow or sprain. The foot, after such trauma, does not recover in the usual time but remains painful, stiff, and even swollen. A month or two after the injury, marked tenderness develops over the joint affected, and an evening rise of temperature is noticed. X-rays finally confirm the diagnosis, demonstrating loss of substance. *Luetic* arthritis must be excluded by the absence of the usual history and the lack of signs of the constitutional disease, aided by a negative Wassermann. It is important to remember the existence of isolated non-tuberculous disease of the scaphoid (scaphoiditis or Koehler's disease), which closely simulates tuberculosis of this region. It is to be recognized in the X-ray by the presence of disease limited strictly to the scaphoid which is reduced in size, while the adjacent bones, usually involved in cases of tuberculous disease, are seen to be untouched. The clinical picture is one of flat foot with great tenderness over the scaphoid. This disease is of unknown etiology, runs a benign course and with protective treatment comes to an end in about six months. Another mild disease seen in childhood and likely to be confused with tuberculosis is epiphysitis of the os calcis with tenderness on either side of the heel over the epiphyseal line. Its origin is generally obscure and after a few months it passes away. It may be truly termed one of the "growing pains" of childhood.

The treatment of bone tuberculosis of the foot is rest and crutches, immobilization at right angles in a plaster shell fenestrated or removable to permit the use of direct sunlight. In addition, general anti-tuberculous treatment should be carried out. Abscesses should be left alone if not progressing, but if increasing in size should be aspirated and injected with a drachm or two of iodoform emulsion, a pressure bandage being subsequently applied. In the case of sinus formation every precaution should be taken against the entrance of mixed infection. In a word, the treatment is conservative. In childhood it is astonishing to see from what extensive disease a foot may recover, while in the adult a tuberculous ankle joint will practically never get well enough to permit of ordinary use.

(4) Up to the age of about eight years a case of *incompletely cured club foot* is to be treated conservatively by wrenching, over-correction and plaster. After this time, removal of a wedge of bone from the outer side of the foot may be expected to do less damage than the repeated trauma of wrenching. The wrenching, of which several applications are generally necessary, is carried out to the point where the foot can be over-corrected by a touch, and in this position plaster-of-Paris fixes the foot for six or eight weeks. After operative interference over-correction need not be so extreme. The wearing of braces is to be discouraged as ineffectual. A cure is to be credited when the patient can voluntarily over-correct his foot, and it is to be emphasized that to the possibility of cure there is no age limit.

Still's disease is a rare form of polyarthritis seen in childhood. Its importance lies in the fact that it generally leads to dreadful crippling. The association of swollen and painful joints, the fingers as a rule included, with general enlargement of the lymph glands and spleen, makes the diagnosis unmistakable. Removal of any infective focus, arsenic, cod-liver oil, heliotherapy have been employed in the few cases that have recovered. A warm climate permitting much open air is of benefit, and the child should be urged to continue the use of its legs. When once it takes to bed the picture is too often one of hopeless invalidism.

In the flat foot of adult life pain and weakness are usually complained of in the region of the ankle, while tenderness can generally be demonstrated under the scaphoid at the site of the over-stretched calcaneo-navicular ligament. Strapping the foot in an inverted position usually gives immediate relief. This is because the weight of the body is deflected towards the outer and stronger side of the foot, thus relieving the intolerable pressure on the inner and weaker side. With this end in view, the inner side of the patient's shoes, both soles and heels, is raised one-quarter to one-third inch, with the advice to adopt an intoeing gait and to throw as much weight as possible on the outer side of the foot. Certain exercises are useful in strengthening the muscles which invert the foot and so support the arch. Perhaps the most helpful of these is a rotating movement downwards, inwards and upwards of the foot, which can be done quite satisfactorily without removing the shoe. This exercise should be repeated for three or four minutes at least ten times daily. Young and active patients, even while carrying on their daily work, are frequently cured by such measures.

Foot plates or arch supports are indicated in patients of a heavy build, whose deformity is well marked and the pain and disability distressing. Here speedy relief of suffering is indicated, and strapping the foot is mechanically insufficient to give the necessary amount of support. In general, plates are useful in the middle-aged and elderly, where little response is to be expected from exercises, gait, etc. In addition they are useful in cases where one wishes speedy relief from static backache, sacro-iliac or sciatic pain, chronic hip and knee strain, etc. Plates are contra-indicated in cases where the foot resists inversion and cannot be held by strapping in a corrected position. Flexibility must first be gained by the use of a brace extending from heel to calf up the outer side of the leg. By means of an ankle strap or bandage, the foot is pulled towards the upright of the brace into a position of inversion. In very rigid cases, where shortening of the peroneal muscles and perhaps even adhesions of the tarsal joints prevent the movement of inversion, an anaesthetic is necessary to permit forcible wrenching of the foot and at times to permit resection of a portion of the shortened tendons. Plaster-of-Paris fixation for six weeks in an over-corrected position should follow, to be succeeded by brace treatment until a normal power of inversion has been obtained. Plates are not usually successful in cases of marked deformity owing to their discomfort, the scaphoid tubercle bearing heavily and painfully upon the steel support. In such cases one may use a softer leather support built in the shoe, the latter being raised on the inner side. In some cases resection of a wedge of bone from the inner side of the tarsus is indicated. A third contra-indication to the use of plates is the presence of acute or chronic arthritis in the foot, in which case but little relief is obtained, as the foot is too sensitive. The Whitman type of plate is to be recommended, made of steel forged to fit a corrected plaster model of the foot.

The recognition of *arthritis* of any kind in a disabled foot is of the utmost importance. Disturbances of the longitudinal and metatarsal arches, hallux valgus, hammer toe, etc., when of purely mechanical origin may be expected to respond to purely mechanical treatment. The presence of arthritis, on the other hand, at once transforms the problem of treatment from a fairly simple procedure involving strapping, foot plate, etc. to one which may be found to be much more difficult, involving as it does a search for the cause. Arthritis is to be recognized (1) by the presence of pain and tenderness, and still more so by swelling in other joints of the body which are under no mechanical strain, as for instance swollen finger or toe joints in a case of flat foot, for as a rule, a swollen joint indicates arthritis; (2) by the absence of relief following such a therapeutic test as strapping a flat foot or raising a metatarsal arch; (3) by the known presence of an infective focus such as chronic tonsilitis or urethritis. A pitfall for the unwary exists when both arthritis and mechanical defects co-exist. A frequent example of this is the presence of gonorrhoeal arthritis in a flat foot, where a rosy prognosis based on the obvious arch condition will bring discredit to the physician consulted. In such cases, which are very frequent, each element of disability, whether mechanical or infective, needs its own proper treatment. For the arthritis a source of infection must be sought, whether in tonsils, urethra, teeth, intestinal tract, systemic infection, or metabolic processes. Baking and massage will be found useful adjuncts to the treatment. Gonorrhoeal infection is to be suspected when pain and tenderness exist under the heel, at the junction of the plantar fascia with the os calcis. The pain of such a condition is lessened by removal, so far as is possible, of the pressure under the heel. This is done by the use of a small heel-pad with a hole corresponding to the tender point, by raising the sole and heel on the inner side when the foot is seen to be pronated, or by the use of a highly arched foot plate designed to take as much pressure as possible from the heel. When this inflammatory process (gonorrhoeal periostitis) has gone on to the extent of forming a bony spur which may be felt or shown in the X-ray plate, an excision may be expected to give good results.

Tuberculosis of the ankle joint, when seen in the adult, has usually been present for years. As a rule this condition resists treatment to a much greater extent than obtains in childhood, and cannot be cured to the extent of bearing weight usefully. After conservative treatment has been given a fair trial, amputation should be considered. Tuberculosis of the tarsus has a somewhat better prognosis and is to be treated by freedom from weight-bearing, immobilization, heliotherapy and general antituberculous treatment.

Disturbances of the *anterior or metatarsal arch* are frequently met with. The metetarsal heads may be noticed to be depressed, a callosity on the sole marking the point of increased pressure. Tenderness will be present in the metatarso-phalangeal joints affected, and the pain, when acute, may radiate up the leg. A weakened longitudinal arch often accompanies this, and should be corrected. Strapping the metatarsus with adhesive plaster, a pad of piano felt three-eighths of an inch thick being inserted just proximal to the tender point, as a rule gives speedy relief when no arthritis is present. Baking, massage and exercises for the foot and toes help in restoring the normal mechanical action of this part of the foot. A bar of leather three-quarters of an inch broad and one-quarter of an inch thick often gives much relief when attached to the sole of the shoe immediately behind the metatarsal heads. Where the toes are drawn up into the air by marked contraction of the extensor tendons and correction of the deformity is impossible one should consider operative interference.

Morton's metatarsalgia is characterized by sudden sharp and severe pain in the region of the fourth metatarso-phalangeal joint, radiating up the leg and only to be relieved by removing the shoe and manipulating the foot. The metatarsal head will generally be found depressed, and treatment should be directed towards remedying this deformity by pad, foot plate or bar. In very resistant cases the metatarsal head, which is thought to cause the pain by interference with the digital nerve, may be excised with immediate relief.

One of the most difficult problems in the foot concerns the presence or absence of arthritis in these cases of metatarsal pain. The metatarsal arch may be plainly depressed, with pain and tenderness referred to the dropped metatarsal heads. Even in such a case, one should resist the temptation to attribute the entire disability to the obvious mechanical condition, and should await the result of corrective treatment, which may be considered a therapeutic test, before risking the error of too favourable a prognosis. An arthritic element may declare itself here by persistence of the pain or by the history and actual appearance of pain in other joints of the body, upon which the additional problem at once presents itself of determining the source of the arthritis.

Hallux valgus or bunion usually arises as the result of shoes too narrow or too short. Arthritis is also a frequent cause. Mild cases of mechanical orgin are to be treated by proper shoes with plenty of room for the toes and a straight inner border. To this should be added attention to the pronation which usually accompanies hallux valgus, exercises for the foot and the toes, and a pad between the great and second toes. If arthritis exist it should be treated by removal, if possible, of the cause. In well marked cases Hueter's operation of resection of the head of the first metatarsal bone is the most satisfactory procedure. One must be most careful to exclude arthritis in any case where operation is in view, as its presence is likely to result in a persistently painful joint after the operation, and, at times, ankylosis of a very disabling nature may supervene.

Hammer toe, usually due to improper footwear, is readily cured by resection of the prominent distal portion of the proximal phalanx. This is quite easily accomplished through a lateral incision under novocain. The toe should then be splinted to its fellows on either side. Tenotomies, manipulations and strappings do not as a rule succeed.

Tenosynovitis of the tendon of Achilles may appear after strain or injury, especially in cold weather. Tenderness, and at times even crepitus, are to be elicited. The condition is usually characterized by persistence. Relaxing the tendon by raising the heel a half-inch is of use in the treatment, the foot also being bandaged, baked and massaged. Some cases appear to follow or to be accompanied by infection, and treatment of a sore throat, urethritis, etc. may be necessary to a cure.

DERMATO-MYOSITIS

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ALTHOUGH a considerable number of cases of dermato-myositis or poliomyositis have been recorded, the affection must be regarded as one of the rarer manifestations of disease. Lorenz draws a sharp distinction between suppurative processes in the muscles, the result of general sepsis, and that in which there is a widely spread myositis without tendency to suppuration; reference to the latter only is made in this communication. Owing to the frequent association of a firm, brawny swelling of the skin and subcutaneous tissues and of cutaneous eruptions, the condition is often referred to as dermato-myositis.

The following case was observed in 1915 at No. 1 Canadian General Hospital in France.

Private M. aet. 45, was admitted to No. 1 Canadian General Hospital on November 12, 1915, complaining of pain and swelling in the forearms and to a less extent in lower extremities. His story on admission was that he had not been feeling well for five weeks, having lost his appetite and suffered from nausea and severe diarrhoea for several days. Three weeks previous to admission he noticed, on lifting a bucket, that his hand was stiff and weak and he was unable to use it. At the same time he noticed that his legs were painful and stiff and they dragged on walking. The arms became gradually more swollen, attaining their present condition in a week, since when they have remained stationary. He has had no fever or chills, but had a feeling of being cold without any abnormal elevation of temperature.

Previous History.—He has been in the army for twenty-one years, being stationed in India from 1898 to 1904, and when there, suffered from repeated attacks of malaria. Nine or ten years ago he suffered from an attack similar to the present one; his hands and arms were swollen to the elbows, and he was laid up for six weeks.

Examination.—He is a fairly nourished man with a good colour. Temperature 98°, pulse 72, respirations 20. The forearms front and back, especially the former, are swollen, rather brawny, pitting on pressure and are slightly tender over the swollen areas. Owing to the infiltration of the forearms he can only move the fingers about half an inch. There is slight œdema just above the elbows and some tenderness of the deltoids, pectorals, and muscles of the back. In the legs there is an area 2½ x 1½ inches slightly raised over the extensor muscles just above the ankles. The edge of the spleen can just be felt, the chest and abdomen are otherwise normal. The urine is acid, sp. gr. 1022, with a trace of albumin, no sugar and a few hyaline and granular casts. There are 24,000 white cells in the blood to the c.mm. and 2% of eosinophiles. A differential count on a second occasion showed polymorphus 78%, eosinophiles 1%, small mononuclears 13%, large mononuclears 6%, transitionals 2%.

November 18th. He vomited several times yesterday and had several loose stools. Under gas anaesthesia a small portion of muscle was removed from the fore-arm for examination. Swelling noticeable in arms has extended to the hands which are slightly reddened. A troublesome cough which has existed for several days has increased in severity; the lungs are full of coarse râles; and patient complains of a sharp catching pain on the left lower thoracic region.

November 19th. Patient is very weak; the pulse is small and feeble; cyanosis is present with defective resonance at both bases. Death took place that same evening. During his stay in hospital, the temperature had remained normal or subnormal and the pulse varied from 72 to 84 until the last day of life.

Autopsy by Dr. J. J. Ower. The body is that of a well developed man. There is marked pitting on pressure on forearms, hands, thighs, and calves. The *peritoneal cavity* is negative.

The lungs.—A small amount of clear yellow fluid was found in the pleural cavity on the left side. The surface of the left lower lobe has a fine grandular appearance, and a few shreds of a fibrinous exudate are seen. The left lower lobe is firm to the touch and on section presents a greyish surface from which a frothy serum exudes. Sections float in water, and there is no evidence of broncho-pneumonia. There is a large amount of bloody fluid at the right base but otherwise the lungs are normal.

The heart is slightly enlarged; a number of small white plaques are seen on its surface; the valves are normal; the muscle is somewhat pale.

The liver, kidneys, stomach and *intestines, pancreas, bone marrow* and *adrenals* are normal. The spleen is small, its capsule wrinkled but otherwise negative.

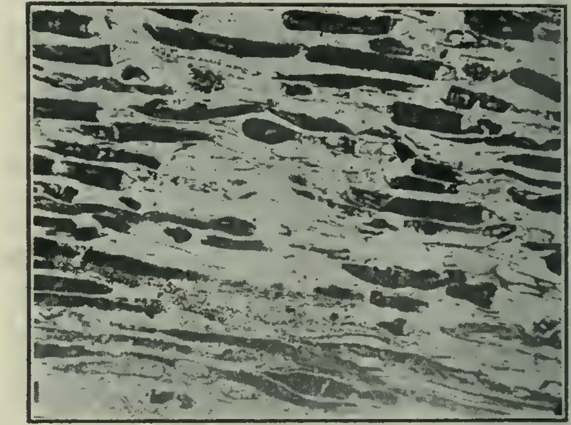
Muscles.—The voluntary muscles generally show marked pathological changes. The greatest changes are seen in the recti and in the psoas which present a generalized patchy mottling (orange yellow and brown) due apparently to small haemorrhages and degeneration of the fibres. The left psoas shows a large intra-muscular haemorrhage with a firm clot in the centre of the muscle. Numerous small patechial haemorrhages are seen in all the muscles of the arms and legs and in the pectorals; but they are not so numerous as in the recti and psoas. The inter muscular fascia shows marked œdema in some areas and in the arms there is a considerable amount of subcutaneous œdema. The muscle fibres are very fragile.

Microscopical Report.—The heart is negative; the liver, spleen, kidney and pancreas are normal. There are no signs of pneumonia seen in sections of the lung tissue.

The following report furnished by Dr. Rhea is based upon a careful examination of sections made from different striated muscles. The type of lesion is similar in the various muscles examined except that the degree and extent of involvement varies. In all sections there is a diffuse lesion which involves the muscular tissue, interstitial tissue and to a less extent, the blood vessels. The muscle shows marked changes. There is loss of striation, varying degrees of œdema, vacuolation and degeneration. Scarcely has a single muscle fibre escaped in the various sections examined. The degree of involvement varies not only in the different fibres but even within the same fibre. Some of them show very advanced degeneration; others early changes and still others all the changes referred to above. This is well shown in the micro-photograph of a longitudinal section of a muscle. The interstitial tissue is œdematous and in places shows recent hæmorrhage. The blood vessels are distended with blood and one vein, as illustrated in the drawing, shows a recent thrombosis. Cultures from the incision taken during life on bouillon, bile, agar and litmus milk, aerobic and anaerobic, were sterile.

The diagnosis is this case was suggested by the tender, brawny, spindle-shaped swelling of the forearms and the swelling in a less marked extent of the legs. Confirmation was obtained by microscopical examination of a piece of muscle excised from the forearm. The history of a previous attack is probably correct as it is supported by many other recorded cases. Although fever is usually present, its absence has been occasionally noticed as in a case of Koster's and one of Clowe's.

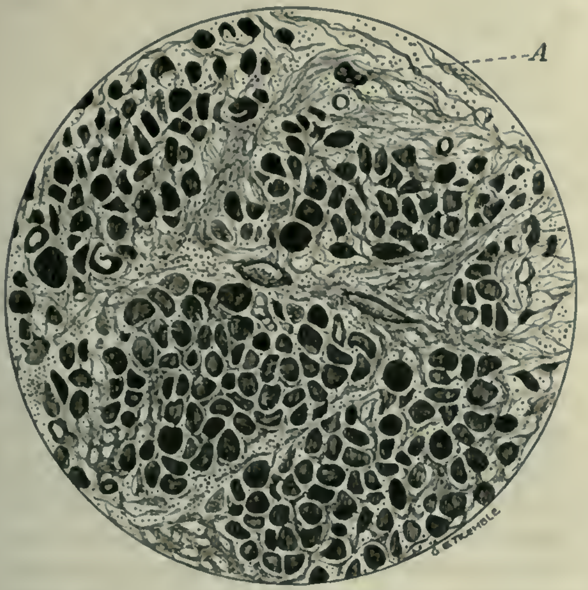
The leucocyte count of 24,000, higher than in other recorded cases, was noteworthy in view of the entire absence of cellular exudation in the muscles: it was also higher than might be expected from the numerous hæmorrhages. splenic enlargement, although not found at autopsy, was present during life, and the wrinkled character of the capsule was in keeping with a previous enlargement. There was no change in the kidneys to account for the albuminuria and casts. Trichinosis was considered a possible diagnosis, but the absence of any swelling of the face whilst under observation, the lack of eosinophilia, and finally, the microscopic examination of the muscle fibres excluded this condition.



Longitudinal section of muscle.—Micro-photographic

The *etiology* of the disease is still wrapped in obscurity. Although regarded as an infection by many writers, cultures have almost invariably proved sterile. Schmitz and Koln, however, isolated a staphylococcus which caused fatal sepsis in animals and which they regarded as specific, as the morbid changes were limited to the muscles. The probability of an infection, however, is rendered probable by certain features of the disease, such as the elevated temperature, the small celled infiltration in the muscles, the splenic enlargement, and the occasional occurrence of leucocytosis and of inflammation of the serous sacs. The malady again is sometimes preceded by angina or acute articular rheumatism and it is further allied to the latter by the cutaneous manifestations such as erythema and purpura.

Other writers regard the condition as due to a toxin. Senator records a case following the ingestion of stale crabs. Albu reports one in which attacks came on when the bowels became constipated and Boeck, one following the rubbing of the skin with copaiba. The early gastro-intestinal disturbances such as diarrhoea and vomiting is also regarded by these observers as supporting their view, as is also the absence of cellular infiltration and of fever observed in some of the reported cases. Herrick records a case probably due to syphilis, and Lorenz one with recurring attacks attributed to the same cause.



Cross section of muscle showing œdema, hæmorrhage and degeneration of muscle fibres.
At "A" is a thrombosed blood-vessel.

Morbid Anatomy.—The morbid changes are striking and widespread in the subcutaneous tissues, skin and muscles. Oedema is present in the subcutaneous tissues and between the muscular fibres, even penetrating between the fibrillæ. The muscles themselves are more friable and softer than normal. In Hepp's case there occurred a rupture of the rectus abdominis. The colour is for the most part paler than usual, varying from a pale brown or red to orange yellow. Hepp compares the appearance to the muscles of the rabbit. Small and occasionally hæmorrhages of considerable size are found in some cases. Microscopically most cases show a marked intermuscular cellular infiltration, penetrating between the individual fibres and found particularly around the blood vessels, which are usually distended and filled with blood. This infiltration, as in the case here recorded, may be entirely absent and the changes confined to the fibres themselves. These present varying forms of degeneration. In some the fibres disappear leaving only sarcolemma; in others the striæ are indistinct or absent and there may even be a fine longitudinal striation, or waxy or granular changes. The fibrillæ are sometimes swollen giving rise to localized bulgings and convoluted outlines. An increase of the nuclei of the sarcolemma and of the muscular fibres are sometimes met with and are regarded as evidence of regeneration. In fatal cases it is, however, more common to find a disappearance of muscle nuclei from many of the fibres.

The *clinical manifestations* of the disease vary considerably. Lorenz in his excellent article in Nothnagel's *Specielle Pathologie* distinguishes four types: (1) dermatomyositis; (2) poliomyositis haemorrhagica; (3) poliomyositis associated with erythema multiforme; (4) certain unclassified cases. Apart from convenience of description, this method of treatment seems unduly complicated and in the absence of any known etiological factors, we cannot draw sharp distinctions from variations in clinical or pathological characters. The onset may be abrupt or preceded by prodromal symptoms, particularly in chronic cases, extending over a period of a few days or weeks, consisting in lassitude, headache, or gastro-intestinal disturbance such as anorexia, nausea and vomiting. The temperature is usually elevated, being sometimes as high as 104° or 105° with chills and sweats. A few cases are recorded in which fever was absent throughout, but profuse sweating is often a prominent feature throughout the malady. Involvement of the muscles is marked by pain, which may be severe, stiffness and particularly by sensitiveness to pressure. With these symptoms or following shortly afterwards, swelling and induration develops over some of the affected parts; pitting on pressure is absent or only brought out by very firm pressure, but is noticeable at the borders where induration is less marked. Over many muscle areas marked tenderness may exist without swelling. Most frequently the swelling, pain, and tenderness begins, in one or more limbs, often extending to the trunk or other limbs. It may, however, start in the face, especially in the eyelids and lips. In the limbs the region from elbow to wrist and from knee to ankle are most frequently affected, giving a spindle shape to the limb and often sparing the hands and feet. Muscular weakness is a marked feature, but all movements are so painful that it is difficult to say whether the limitation of movement is due to pain or to muscular changes.

In addition to the limb muscles, other groups are frequently involved. The shoulders and hips, buttocks and trunk, the abdominal and intercostal and diaphragm may all share in the morbid process. Less frequently the muscles of the neck and tongue, of mastication and of the eye may become affected.

The *cutaneous manifestations,* although not a necessary part of the malady, are present in most cases, varying considerably in their extent and appearances. Reddening of the swollen areas has led to a diagnosis of erysipelas and in the face such a resemblance may be closely simulated at the onset. Other eruptions which have been observed are macular roseola, urticaria, nodules like erythema nodosum and hæmorrhages in the skin. Pigmentation of the skin over wide areas is an occasional sequel and scleroderma has been observed by Oppenheim and Unverricht. Involvement of the laryngeal and throat muscles sometimes leads to suffocative attacks or to inhalation pneumonia. Kells (2 cases) and Oppenheim (1 case) record changes in the heart similar to those seen in the skeletal muscles

Recovery when it takes place is usually complete, but in a few instances induration and contraction result. Relapses are frequent, the swelling and tenderness passing from one muscle territory to another, whilst improvement or recovery takes place in the muscles earlier affected. A history of recurrence of the disease after an interval of months or years has been observed. In Thayer's case, attacks coming on as suddenly as angio-neurotic œdema and passing off in a few days occurred at intervals of from six months to three years, whilst Blumer reports a case in which two distinct attacks both followed tonsillitis.

Albuminuria is not infrequent and may be present in both febrile and non-febrile cases; acute hæmorrhagic nephritis is recorded by Senator. In Jacobi's case acute cirrhosis of the liver was found. The leucocyte count is usually below ten thousand (10,000). In Schmitz and Cohn's case there were 15,000, and in the case recorded above, 24,000.

A fatal termination is to be anticipated in a large proportion of cases, particularly in the acute forms. In 28 cases collected by Steiner· 17 proved fatal. The immediate cause of death may be due to failure of the respiratory muscles leading to inhalation pneumonia or there may result a terminal infection of the pleura or pericardium. In other instances it is apparently due to toxæmia.

I am indebted to Dr. Simpson for the microphotograph and to Dr. Tremble for the drawing of a cross section of muscle.

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Treatment of Pneumonia.—Dr. Henry F. Stoll, Hartford, Conn., writes: Don't think of pneumonia solely as a disease of the lungs. Heart failure is responsible for many fatalities. At the first examination and at each succeeding visit, note the position of the apex beat and observe the quality of the heart sounds; this can be done without disturbing the patient, and may enable one to detect the first signs of a failing myocardium or the beginning of pericarditis. Don't make a complete examination of the lungs every day unless you suspect pus; it exhausts the patient. Never direct a patient to "sit up" or to "roll over" if very ill, to examine his back; he may be turned on his side with little discomfort if it is done by reaching across the patient, placing one hand under the further shoulder, the other under the pelvis, and gently and slowly turning him toward you. Whenever there is a suspicion of diminished myocardial reserve, small doses of digitalis should be begun from the onset. Don't forget that an increase in restlessness and in the respiratory rate may be due to a distended bladder, and that many cases of incontinence can be cured by a catheter. Save in the very feeble, cold, fresh air is desirable—but be sure that you have a warm patient. When serum (Type I) is indicated, its curative effects are directly proportionate to the promptness of its administration. Quiet and sleep are absolutely essential, and the elimination of unnecessary exertion may be life-saving.—*Jour. Am. Med. Assoc.*, April 14, 1923.

A SERIES OF CASES OF PURPURA HAEMORRHAGICA AND APLASTIC ANAEMIA DUE TO CHRONIC BENZOL POISONING IN A CANNING PLANT*

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With case reports

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and

A. B. Jackson, M.B., *Simcoe*

THE increasing use of benzol and its congeners for industrial and commercial purposes makes it a matter of great practical importance that physicians as well as the public at large should be fully aware of the dangers attending the use of these products and of the symptoms by which the poisonous effects are manifested. The question is no less interesting from the scientific standpoint on account of the light which a study of the toxic effects of benzol sheds upon the etiology and pathogenesis of purpura hæmorrhagica and affections of the hemopoietic system, especially upon aplastic anæmia. I therefore feel much indebted to Dr. Boyd for the opportunity of seeing with him a number of patients suffering from chronic benzol poisoning and wish to offer my congratulations to him and Dr. Jackson, who was associated with him, for the promptness with which they recognized the nature of the trouble, the thoroughness with which they followed up the cases, and the effectiveness of the measures used to control the situation.

The symptomatology is so strikingly illustrated by the cases which Dr. Boyd and Dr. Jackson will report, that one need not dwell on it further at this time so that I shall confine my remarks largely to a more general consideration of the subject and to a brief review of the literature.

Benzol, $C_6 H_6$, is made during the fractional distillation of coal tar, coming over at about 80° C. The commercial variety usually contains more or less toluene, $C_6H_5CH_3$, and xylene, $C_6H_4(CH_3)_2$, which have a slightly higher distillation point. In making coke and its by-products, these lighter materials are given off first, are absorbed in higher boiling oils and subjected to fractional distillation. Crude carbolic acid is the next product to come off; then naphthalene; then anthracene, and finally coal tar pitch. In the manufacture of aniline dyes, benzol, toluene, xylene, all of which are toxic; naphthalene, which is less toxic; and anthracene probably non-toxic are the "crudes" used in the process.

Benzol is also one of the derivatives of petroleum. Petroleum is a mixture of hydrocarbons from CH_4 to $C_{30}H_{62}$ with varying proportions of the lighter and heavier compounds. The lower distillates, that is, those which come off at 30°C. to 70° C. are used chiefly for motor vehicles: the next series, namely gasoline and benzine and naphthalene, come off at 80° to 170° C. and are largely used in industry as fat solvents, in dry cleaning, for rubber cement, for quick-drying paints, and for varnish and shellac: kerosene comes next, then the heavier lubricating oils, then the vaselines and finally the paraffins.

Acute poisoning from the fumes of naphtha or from contact with it, has been noted in English and American reports on trade sickness in the rubber industry, by the French in connection with dry cleaning, by the Germans in both these industries and in the use of quick-drying paints. In rubber manufacturing plants where large quantities of naphtha are used in cement and usually kept in uncovered cans on the benches, a mild form of acute poisoning is very common, known as the "naphtha jag." Symptoms consist of excitement, gaiety, giddiness, irritability, pugnacity, followed by depression, headache, slight nausea, insomnia, lassitude, etc. Chronic naphtha poisoning has no characteristic symptoms. Potts reports a case of encephalitis caused by gasolene fumes in a man who worked for four months filling automobile tanks. I know of two cases of severe gasolene poisoning in Toronto—one fatal.

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*Read before the Academy of Medicine, Toronto, Tuesday, Jan. 9th, 1923.

Benzene, toluene and xylene act directly on the central nervous, the circulatory, respiratory and hæmopoietic systems and especially on the bone marrow. They also cause capillary hæmorrhages due either to solution of the endothelial cells or to fat embolism with rupture of the capillaries; fatty changes in the kidney and liver may result, and hæmorrhages from the gums, nose, throat, stomach, into the lungs, mucous membrane, skin, serous membranes, etc. There is lessened resistance to bacterial infection. Lesions may be reproduced in animals by inhalation of the fumes in a closed chamber. Excitement and delirium may be early symptoms. At times it is the rescuer who loses his life, (an evidence of individual susceptibility) and young girls are especially liable to the effects of the poison.*

In the explosives industry in the United States in 1916-17 there were 14 instances of poisoning from benzol or its derivatives. Usually industrial benzol poisoning pursues a slower course and presents the typical picture of purpura hæmorrhagica and aplastic anæmia. Such cases have been reported by LeNoir and Claude in French dyeworks, by Austrian factory inspectors in rubber works, by Santesson in a tire factory in Sweden, by Selling and by McClure in an American cannery using benzene-rubber cement, and by Harrington in rubber works in Massachusetts where the solvent for cement was benzene.

Reports of the British Chief Inspector of Factories for 1918 contains reference to two cases of purpura hæmorrhagica in men spreading fabric for balloons. Many of these cases ended in death, associated with severe hæmorrhages and blood destruction, the white corpuscles falling to 800 or less and the reds to less than one million. Benzol poisoning is increasing in American industry since the War as benzol is now produced in large quantities in America in the fractional distillation of coal-tar: it is displacing the more expensive petroleum solvents for rubber in the making of rubber cement, paint and varnish removers, coal tar paints, shellacs, airplane dopes, and as the starting point in the manufacture of phenol by the usual American process: it is also replacing toluene and xylene in the manufacture of drugs, perfumes, dyes and explosives.

In Germany where large numbers of men have been employed in dye manufactures for many years, it has been found that an undue proportion of these workers suffer from a papillomatus type of tumour of the bladder, though it has been impossible to reproduce such growths in animals by the administration of the compounds. In human beings there appears no doubt as to its connection.

Benzol derivatives such as nitrotoluene, chloro- and nitrochlorobenzine, dinitrobenzine and dinitrophenol, etc., act in a somewhat similar way to benzol though less actively. Sickness among workmen in France, England and the United States led Perkins to undertake a study of munition intoxication. The portals of entrance of the poisons are the skin and the respiratory and digestive tracts, depending upon the nature of the employment.

Selling reported the first important outbreak of benzol poisoning in America, occurring in a can-manufacturing plant, employing 325 hands in the suburbs of Baltimore. In the coating room a substitute for solder was used consisting of pure rubber, rosin and a colouring matter dissolved in commercial benzol. Among the twenty-three hands in the coating room working at the cover machines, there were 14 girls between 14 and 16 years of age who were particularly exposed to the fumes resulting from evaporation of the benzol in the drying of the cement. In this process ten gallons of benzol were evaporated daily in a room with open windows and with excellent ventilation in summer. A well marked odor of benzol was noticeable about the machines and a weaker odor throughout the room generally. Three girls, 14 years of age, showed the effects of poisoning and one of these may be described as typical of the condition.

The patient was feeling well, but on June 1, 1909, was noticed to be pale and had a pur-

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*Another fatal case is reported in the Toronto morning papers, May 18th.

puric eruption. She was admitted to hospital June 28th: she had been working in the factory for 4 months with no symptoms whatever, and left owing to her mother's illness. In the latter part of May, she first noticed blue spots on the arms and legs and on the trunk and face: from the gums, nose and throat developed, that from the throat being severe and persistent. Later, weakness and dizziness developed. On admission it was noted that she was well built and well nourished but had a waxy pallor. Scattered purplish macules were distributed over the arms and legs, and on the trunk and face: there were also some larger ecchymoses. The gums were bleeding slightly, especially about a broken root. About the left tonsil and right anterior pillar there was a dark-brown necrotic-looking mass. The heart and lungs were normal: the spleen was not enlarged: the liver was slightly enlarged. There was moderate neuro-retinal œdema with muscular hæmorrhages. The patient became paler, toxic and stupid; the pulse small and weak. After transfusion she improved for a time and then relapsed, became weaker, and died July 6th. Temperature ranged from 99.4° to 104.6°: pulse 108 to 165. The urine showed a trace of albumen and hyaline and granular casts. No jaundice. The blood was pale and watery, platelets were practically absent, one megaloblast but no normoblasts were found. Microscopic examination of tissues obtained at necropsy showed aplastic bone marrow, hyaline necrotic areas in the Malpighian corpuscles of the spleen; there was also a fatty degeneration of the liver and heart muscle.

The three cases of chronic benzol poisoning which we (Boyd and Jackson) are reporting, occurred in close sequence in a plant manufacturing "sanitary" tin cans, in which was used, as a medium for packing or sealing the joints between the body and ends of the cans, a solution of gum rubber, beeswax, and an inert coloring matter dissolved in benzol, known to the employees as "dope."

The solution is applied mechanically to the edge-groove of the caps and the benzol is driven off by steam heat. The caps, on delivery from the drying machines, undergo inspection for faulty application or other defects. Faulty ones are "re-doped," or if spotted elsewhere than where the solution should be applied, are cleaned with pure benzol, either applied with a brush or sometimes with a wad of cotton-waste held in the worker's hand.

This process has been in use in this plant for the last nine years with no known trouble up to the spring of 1922. The source of supply of benzol had been changed during the past year. Some of the employees were in the habit of using benzol to clean their hands on leaving work.

Case I. came under observation March 10th, 1922. Due to the lack of previous trouble of this kind, the case was not recognized as benzol-poisoning, but considered as a purpura hæmorrhagica due to an unknown cause. The patient's family, however, early conceived the idea that her illness was due to the "dope." For this reason, after the patient's death, we consulted the Workmen's Compensation Board asking for information and for an opinion as to the possibility of the case being one of benzol poisoning. The Board, however, did not think there was any probability of this.

The patient was a girl, aged 15 years, employed for about three months on the compound applying machine, part of her time feeding caps, and part of her time removing at the outlet. She had been sturdy and well nourished. She complained of bleeding from the gums and swelling of the upper lip; the gums were spongy with bleeding around most of the teeth, particularly about the stump of the first left lower molar. The swelling of the upper lip was apparently due to extravasation of blood. The patient was very pallid, felt weak, and tired easily. About two weeks previously she had sore on the lower lip which she stated had been inflamed and black. Personal and family history were negative. On *March 11th* a fine purpuric rash developed on both feet and legs up to the hips, and an extravasation of blood into each upper eye-lid; there were also several large purpuric patches scattered over the body. The temperature ran irregularly up to 103°. On *March 14th* hæmaturia and melaena developed. On the night of *March 15th*, epistaxis began from which she was badly exsanguinated by morning. Gelatin and haemostatic serum were given subcutaneously without effect. Packing the nose with adrenalin stopped the bleeding temporarily. On the afternoon of March 16th, 350 c.c. of her father's blood (citrate method) was transfused. The transfusion was followed in 15 minutes by a sharp chill lasting about 20 minutes. As the chill started the bleeding stopped. For 24 hours she was much better in appearance. The haematoma in the upper lip had to be opened on account of suppuration. This abscess cavity started bleeding freely. From this time she steadily failed, gradually became comatose, the temperature rose to 105°, and she died during the early morning of the 20th. No autopsy.

Case II.—Male, aged 43 years, married; two children; was first seen May 9th, 1922, complaining of frequent nose-bleed extending over the last 18 months or 2 years; there had been occasional morning nausea and vomiting for the last six months. He had lost four pounds during the last 3 weeks. The family and personal history were negative. Patient had suffered from frequent attacks of epistaxis which usually had been preceded by occipital headache, and which were becoming more frequent of late. During the last 6 months he frequently became nauseated and had vomited on beginning work, but felt all right the rest of the day. He was foreman of the compound-applying machines and had been working with benzol for the last 7 years. He had a steady, little, hacking cough: no expectoration. He had been losing weight lately and tired easily. He states that his blood appeared to be rather watery. Complexion very pale, not the lemon tint of pernicious anæmia. He had been bleeding recently from the right nostril. The throat was normal. His mouth showed the presence of several old roots and devitalized teeth, and a general pyorrhoea affecting the gums. A slight mitral systolic murmur was heard over the precordial area. Blood pressure, systolic 106 and diastolic 44 mm. of mercury: lungs clear: abdomen negative: bowels regular: hæmoglobin 60% (Tallquist): erythrocytes 2,022,000 per c.mm.: leucocytes 3,200 per c.mm., color-index 1.5. A stained blood smear showed poikilocytosis, anisocytosis, vacuolation and abnormal staining of the erythrocytes. One normoblast found. He was immediately removed from the benzol fumes, and started on arsenic subcutaneously in the form of "soamin." On May 21st, the hæmoglobin was still 60%: erythrocytes 2,176,000 per c.mm.: leucocytes 3,500 per c.mm., color index 1.37. A blood smear showed the same picture as before; one megaloblast was seen. Blood drawn for a Wassermann test was very fluid and clotting time was much delayed, as the cells all settled out from the plasma before coagulation occurred. His general condition now seemed a little better. The stomach had not been disturbed since getting away from the benzol. Epistaxis had been much less frequent. He had developed three purpuric spots on arms and legs. The Wassermann report was "very strongly positive," so we started him on novarsenobenzol-Billon. He was allowed to go back to work on June 2nd but with strict instructions to keep away from the benzol. On June 19th, the haemoglobin was 75%: erythrocytes 2,632,000 per c.mm.: leucocytes 4,200 per c.mm. On July 25th the hæmoglobin was 80%: erythrocytes 4,024,000 per c.mm.: leucocytes 5,700 per c.mm.: color index 0.9. His general condition was very much better and he had had no epistaxis for over a month. On October 13th, the haemoglobin was 90%: erythrocytes 4,344,000 per c.mm.: leucocytes 5,240 per c.mm. A blood smear still showed slight tendency towards irregularities in size and shape of the erythrocytes and the large mononuclear elements were increased. The patient was looking and feeling well; there had been no epistaxis and he had put on weight. All his teeth had been extracted and he had a satisfactory fitting set of artificial ones.

Case III. occurred at the same time as Case II, under Dr. Jackson's observation. History was as follows: *Case III.*—Female aged 33 years; married, five children. First seen on May 10th, complaining of black and blue areas over lower extremities. These had been present some two weeks and were getting steadily worse. She had been working in the "dope-room" for about three months. She was well nourished. There was some bleeding from the gums. Slight pyorrhoea was present. Over the entire body, but particularly over the lower extremities, were many hæmorrhagic areas varying from petechiae to patches three inches in diameter. The urine contained no albumen, sugar, casts or pus. There were a few erythrocytes. The blood showed haemoglobin 40%; erythrocytes 2,225,000 per c.m.; leucocytes 2,700 per c.mm. A blood smear showed marked crenation, poikilocytosis and degeneration of the erythrocytes but no erythroblasts. The coagulation time was markedly lengthened, as evidenced by the fact that the corpuscles settled to the bottom, leaving the clear plasma above, before coagulation occurred. Wassermann negative. Heart and lungs normal: temperature 101°. Pulse, weak, regular, rate 118. She was put to bed at once on a milk and egg diet, with calcium lactate grains X, every 4 hours. On May 13th her temperature was 102° F., pulse 118; the hæmorrhagic areas had increased in size and number; the bleeding from the gums was more pronounced. She was given 400 c.c. saline intravenously, to which was added 5 c.c. haemostatic serum. On May 15th the temperature reached 102.2°, pulse 130 with bleeding from the nose and marked headache. The leucocytes were now down to 700 per c.mm. Four hundred c.c. of saline were given intravenously and 1 c.c. haemostatic serum every six hours subcutaneously. May 17th, temperature 104°, pulse 140 and weak. She was restless and moaned a great deal. Many of the hæmorrhagic areas were being absorbed and there were very few new ones. She was given 400 c.c. solution of gum acacia, after which her temperature dropped to 101° and her pulse became stronger and slower. She was now put on a carbohydrate diet with sodium bicarbonate, 1 drachm, every three hours. On May 19th although her condition was no worse, the temperature ranging about 101° and pulse 100, she received a transfusion of 450 c.c. of citrated blood. The urine showed no acetone, no diacetic acid, a few erythrocytes, and certain crystals which were taken to be tyrosin. There were no further hæmorrhagic areas. She complained of severe headache. On May 20th, the temperature reached 105.2°, pulse 145. There were whitish patches on lips and vulva. The liver seemed smaller and the skin developed a distinct yellowish tinge. She was given 0.2 gm. novarsenobenzol-Billon intravenously followed in eight hours by 500c.c. glucose solution intravenously with 30% glucose per rectum. drip method. The patient became semi-conscious. On May 21st, the temperature was 106.3° pulse 160, respirations 40. She was then unconscious and died at 4 p.m. The terminal condition was apparently acute yellow atrophy of the liver. No autopsy.

Remarks.—About a year and a half ago a patient came under the care of one of the local practitioners. A strapping, healthy girl of about 17: she had failed markedly in general health and had become very anæmic. The doctor did not examine her blood and came to no definite conclusion as to the cause of the condition. She was working in the "dope-room" at the time. She moved away from town, and consequently from his observation. She is since dead; the cause report stated to be pneumonia. Her physician says that on looking back over her symptoms he thinks that she probably suffered at that time from benzol poisoning.

There is a vague description given by the employees at the plant of a symptom-complex shown sometimes by those coming in contact with the benzol, consisting of sleepiness, stomach disturbances, general weakness and occasionally attacks of epistaxis and purpuric spots on the extremities.

A very striking finding in Cases II. and III. was the extreme fluidity of the blood and the delayed clotting time. In both cases the corpuscles entirely settled from the plasma before clotting occurred. Case I improved considerably in general condition for a few hours following her transfusion. Case III. failed to improve after transfusion. In the first case the father acted as donor: in Case III. the donor's blood was carefully tested out against the patient's for agglutination and hæmolysis and found compatible. The citrate method was used in both cases.

Since the appearance of these cases various steps towards prevention of further trouble have been taken. The driers work in a sheet-iron enclosure which has openings for the reception and delivery of the caps. Heavy suction has been installed both below and above the machines; the caps on delivery, are carried out through an enclosed trough about eight feet long, so as to have the inspectors as far as possible from the fumes. Although the odour of benzol can still be noticed in the department, it is now very faint. Every employee in the department is given a pint of milk about 9 o'clock each morning, and its consumption is insisted on. Approximately every six weeks red and white blood cell counts and hæmoglobin estimations are made on every person coming in contact with the benzol. Any individuals who are not up to a reasonable standard are promptly removed to another department. Very strict orders have been given about allowing benzol to come in contact with the hands or skin. Analysis of the supply of benzol shows that it is well up to the required standard of purity. Comparisons of the safety measures in use in this plant have been made with those elsewhere and the findings leave very little to be desired.

No further cases of even a suggestive character have occurred.

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FOUR CASES OF VOLVULUS OF THE SMALL INTESTINE WITH OBSERVATIONS ON THE ETIOLOGY

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A "TWISTING of the intestines" has long served as the popular explanation for obstruction in the alimentary canal. How venerable is this view will appear when it is recalled that the very term *ileus*, used in English, French and German to denote intestinal obstruction in general, owes its origin to the Greek verb, εἰλειν, meaning "to roll or twist tight up."

With increasing knowledge this twisting or volvulus has come to be recognized as among the rarer forms of intestinal obstruction, brought about by conditions not as yet altogether satisfactorily explained. As to its frequency one may cite the records of the London Hospital, where, during a period of thirteen years, among 669 cases treated for obstruction, 27 (4%) were due to volvulus. Of these but seven involved the small intestine. In certain localities on the continent the percentage incidence appears to be very considerably higher. Among 2,315 cases of obstruction collected by continental authors, 392 or 16.9 per cent. were due to volvulus, of which about one-third involved the ileum (Guibé).

The occurrence within the space of a few months in the Montreal General Hospital of four cases involving the small intestine seems to justify their publication, especially as each case presents a feature of special interest from the view point of the etiology, the bearing of which will be considered after a brief resumé of the case histories.

Case 1.

No. 4830—1920, male, aged 50, Hebrew, labourer, was admitted to M Service (Dr. J. Alex. Hutchison), on October 24, 1920.

History:—On admission he complained of intense abdominal pain in the left lower quadrant, with nausea and of vomiting. He had been in perfect health until the evening before admission, when after a day's fasting he partook of a very hearty meal at 9 p.m. One hour later he had considerable abdominal distress. At 11 p.m. after taking salts he became nauseated and vomited, the vomiting producing relief. At midnight the pain recurred, general, but referred especially to the left lower quadrant. He again induced vomiting, recognized food material previously ingested, and again felt relief. At 2 a.m. the pain reappeared, more severe than before, cramp-like in character and doubling him up. He came to hospital at 7.20 a.m., with pains of marked severity and looking ill. An enema brought away a large constipated stool and much flatus. Still complaining of pain, he was given a second enema, again with success.

Examination.—At 10 a.m. when seen by me, he lay in bed with his knees drawn up, obviously suffering, and occasionally crying out with pain. Temperature, 97°; pulse, 80, of good volume; respiration, 20. The abdomen was quite soft, with tenderness on both deep and superficial palpation in the umbilical region. Visible peristalsis was present to the left of the umbilicus, where an indistinct mass could be seen and felt. White cell count, 13,600. Urine, negative. While preparations for operation were being made, Dr. W. L. Barlow was asked to see the patient, and during his examination of the abdomen the mass suddenly disappeared and the patient gave an exclamation of great relief, saying, "I feel all right now." Operation was deferred. Following this he slept several hours. At 7 p.m. white cell count was 18,200. At 9 p.m. he complained of pain in the abdomen, not severe, and shortly afterwards vomited a porringer full of blood. The following morning his abdomen was still quite soft. Occasional vomiting occurred and enemas returned clear without flatus. At 10.30 a.m. white cell count, 23,200. Temperature 99.4°; pulse, 128.

Operation.—He was taken to the operating room at noon and under ether anaesthesia the abdomen was opened through a mid-line incision below the umbilicus. A quantity of deeply blood-stained fluid escaped. Collapsed small bowel presented which traced upwards to a mass lying in the left lower quadrant, in volvulus, clockwise, consisting of a loop of small bowel devitalized and extremely congested, thickened and swollen, with apparent obliteration of the lumen. There was a sharp constriction at the lower end evidently due to previous pressure. One complete turn (180°) contra-clockwise was sufficient to reduce the volvulus without subsequent improvement in the circulation of the wall, so the damaged portion was excised and an end-to-end anastomosis was made. The excess of fluid was aspirated from the pelvis and a cigarette drain left after closure. The exact level of the obstruction was not determined, but was about mid-way along the course of the small bowel.

The specimen was reported on by Dr. L. J. Rhea, pathologist to the hospital, as follows:—

"Specimen consists of a piece of small intestine 24cm. in length with fatty mesentery attached. The specimen has assumed a perfect horse-shoe shape. At both extremities the tissue is of a light reddish pink colour for a distance of about 3.0 cm. at which point it suddenly becomes dark red, showing a definite line of demarcation. The pinkish areas measure 2 cm. in diameter and the dark area 3.5 cm. From the cut ends of the intestine a thick blood-stained fluid exudes. On opening into the lumen the mucous membrane is dark red and oedematous. The demarcation between the more normal intestinal wall and the tissues involved in the volvulus is sharper at one extremity, the lower. The intestine except for a small portion at each extremity is thickened and oedematous, has lost its lustre, shows a dark red and greyish mottling, with a delicate fibrinous coating and numerous haemorrhagic points. These characters become more pronounced as the lower end of the specimen is approached. The mesentery, especially at the central part of the volvulus, shows marked thickening and changes similar to the adjacent coil. The line of excision through the mesentery and intestine is well beyond the area of devitalized tissue."

The patient made an uninterrupted recovery. On November 15th, a barium meal passed with normal emptying and with no evidence of the presence of the anastomosis. He walked home from hospital on November 17th.

Comment

The explanation of the unusual history and findings was taken to be that the original condition had been a volvulus, that this had been *partially righted* during the pre-operative manipulation, relieving to some extent the mechanical obstruction due to the twisting, but that the extreme congestion of the loop during the twelve hours of acute strangulation had obliterated the lumen, the actual obstruction being thereby perpetuated.

That a volvulus can even partially relieve itself is contrary to the generally accepted teaching, but this conclusion seems to have some justification in the light of the findings.

Thorburn reported two cases where at operation he found similar areas of sharply localized gangrene of the small bowel which he regarded as due to volvulus which had become spontaneously reduced. Guibé who made a very exhaustive study of volvulus, lends some support to this interpretation when he concludes it to be "very probable" that spontaneous recovery may occur in a certain number of cases.

Case 2.

No. 484—1921, male, aged 31, clerk, was admitted to the Montreal General Hospital on February 1, 1921, with severe frost-bite of the extremities.

History.—The history in brief was that during a period of extremely cold weather he lost his way in the country, and unable to find shelter, wandered about for sixteen hours to be picked up semi-conscious by some Good Samaritans who cared for him and sent him by train to hospital.

Examination.—On admission a few hours later he was stuporose, answered questions with difficulty, but seemed to be in no pain. Temperature, not registered by clinical thermometer; pulse, 55. Both hands and feet gave evidence of severe frost-bite, also both knees, both ears, and the left abdominal wall. He made good progress under careful nursing but moist gangrene of the hands and feet supervened, and he became very toxic before any definite demarcation lines were established. To increase the elimination and combat the absorption forced fluids were given. On February 11th he vomited several times throughout the day. At 3 p.m. after an enema which was expelled well colored and with flatus, he complained of severe epigastric pain. Food was discontinued. The abdominal pain continued all night with much flatulence and flatus. At midnight examination of the abdomen revealed no definite tenderness, but some increased resistance. At 3 a.m. on February 12th, an enema was expelled well coloured, with flatus. At 10 a.m. the abdomen was moderately distended and so rigid as to suggest perforation or general peritonitis. His general condition was poor: temperature, 103.4°; pulse, 124; incontinence of urine.

Operation.—Operation was undertaken. A left trans-rectus incision was made. No free fluid was found. Small bowel presented, glazed, cyanotic and sticky. A high volvulus, contra-clockwise, was found comprising several loops of greatly distended small bowel within two or three feet of the duodenal-jejunal flexure. This was lying on the left side immediately subjacent to an ecchymotic patch on the abdominal wall, the site of the frost-bite. The involved gut was of a deep purple hue, but regained its colour when restored by a clockwise turn through a little more than 270 degrees. Some difficulty was found in reducing the volvulus owing to the marked distension of the coils. There was no thrombosis of the mesentery, which was of normal length. There was a distinct constriction at the upper end, above which the jejunum was empty, in fact quite collapsed. The patient bore the operation well; enemas became effectual and the vomiting did not recur, but he failed to recover from his toxaemia and succumbed the following day. No recurrence of the volvulus was found at autopsy.

Case 3.

No. 997—1921, male, aged 70, vendor of patent herb medicines, was first seen on the evening of March 9, 1921, in consultation with Dr. W. W. Ruddick.

History.—He gave a history of long standing glycosuria, and of constipation extending over the previous six months, more aggravated during the month immediately preceding, with occasional attacks of diarrhoea. There had been a loss of weight—forty pounds in two years—but increase in girth. Since March 6th constipation had been complete, despite the administration of copious doses of various patent purgative herb concoctions of which he was the dispenser and vendor. Enemas were ineffectual. Pain was not complained of, and he had no vomiting.

Examination.—The abdomen was markedly

distended and tympanitic. No tenderness was complained of. Rectal examination was negative and there were no masses palpable in the abdomen. An exploratory operation was urgently advised but stubbornly refused: he wanted to take more herbs. By the following morning the distension had further increased, the obstruction was unrelieved and he was much more toxic; operation consent was given. On admission to the hospital, examination of the blood by Dr. Rabinovitch of the Metabolism department showed: urea nitrogen, 64 mgm. per 100 c.c., and blood sugar, 0.20 per cent.

Operation.—At noon, March 10th, under open ether a left trans- rectus incision was made and disclosed a hard annular tumour of the sigmoid, obviously malignant, completely obstructing the lumen of the gut. The entire colon and lower ileum were enormously dilated. On further exploration the presence of an extensive volvulus was established. This involved the terminal four or five feet of the ileum together with the caecum, the mass twisted contra-clockwise and the bulk of it lying to the right of the ascending colon. The actual extent of torsion was difficult to estimate but seemed slightly more than 270 degrees.

The bowel involved was of a deep purplish colour, but the normal colour returned after reduction. The tumour in the sigmoid was very freely movable and no glands were palpable. A colostomy was made in the left side and a Paul's tube introduced.

After the operation vomiting appeared for the first time. It became faecal and persistent in spite of gastric lavages and other measures. The day following operation his blood urea nitrogen had dropped to 30 mgm. per 100 c.c., but the tone of the over-distended bowel failed to return. He developed a double bronchopneumonia which aided in bringing about his death.

CASE 4.

No. 2020—1921, male, aged 43, construction superintendent, living in a small suburb ten miles from the city, was admitted to the Montreal General Hospital May 12, 1921.

History.—During the six months preceding admission, he had had occasional attacks of abdominal pain but had remained at work. Four days before admission he had a recurrence of the pain, cramp-like in character, and associated with vomiting. He was seen by a local practitioner who diagnosed acute gastritis, put him on a liquid diet, and gave him large doses of morphia. The following day I was asked by his employers to see him, and found him markedly tender in the right lower quadrant over the appendix; he was nauseated but had no vomiting. Operation was advised but the patient withheld consent. Two days later I was again sent for and found his condition markedly worse. On the advice of the local doctor he had taken a large dose of castor oil the night before, shortly after which he had a recurrence of the abdominal pain, much more severe than before, with persistent nausea and vomiting, but with no bowel movement.

Examination.—He was immediately transferred to hospital where on admission the pain was severe and paroxysmal, recurring every few minutes. He was nauseated and the vomiting persisted. The pupils were contracted to a pin point. The abdomen was scaphoid, resistant but not rigid, no visible peristalsis was in evidence; general tenderness present. He had had but one small stool since the onset of the illness four days before.

Operation.—Under ether a right trans-rectus incision was made. No free fluid was encountered. A large volvulus, contra-clockwise, involving the upper four-fifths of the small intestine was found and reduced by a turn through 280 degrees. The bowel was greatly distended. purplish and cyanotic but regained its colour and its peristalsis after reduction. The appendix was found acutely inflamed and swollen, especially in the distal half; it was removed. During the operation which was well borne, 1000 c.c. of normal saline were administered subcutaneously. Respiration was very slow and shallow, doubtless due to the continued effects of the morphine. The stomach was washed out until the contents returned clear. Following operation his enemas became increasingly successful, and he had no vomiting. His further progress was most satisfactory and he was discharged well on June 7th, returning to work three weeks later.

Types of Volvulus.—Rokitansky in describing the anatomic possibilities in the occurrence of volvulus described three forms:—

1. Rotation of the bowel on its own axis.

2. Rotation on the axis of the mesentery.
3. Rotation of two loops of bowel, the one on the other, an interlocking.

It will be observed that all the cases in the series are included in the second group which is by far the most frequent form.

Direction of Volvulus.—The older authorities describe the twisting as being usually clockwise, and in the proportion of two to one. In the experience of Ashhurst the contrary has been true. In our cases it will be noted that the types were equally represented.

Etiology of Volvulus.—When we come to consider the etiology of volvulus we find much diversity of view. Among the early explanations of its occurrence is that of Fienus, who in "A New and Needful Treatise of Spirits and Wind Offending Man's Body," (1668), informs us:—"So the excrements being by degrees very dry stop the passage against themselves and the wind, and cause Convolvulus sometimes, but the Colick often, and other great symptoms."

Volvulus, occurring as it does in adults, and seldom below the age of thirty, in contradistinction to intussusception, which is a disease of childhood, has long been ascribed to a lengthening of the mesentery as age advances, due to the loading of the intestinal coils and to the pull of gravity. This is undoubtedly an important factor in volvulus of the sigmoid, the site of the great majority of cases.

Virchow was the first to point out that volvulus of the pelvic colon is generally associated with abnormalities of the pelvic mesocolon, and Treves held that constipation was its most common cause. In this connection it is of interest to note the variations in length of mesentery that can occur. The author recently examined a series of some sixty abdomens in the dissecting room of McGill University and was struck with the wide diversity in the manner of attachment of the sigmoid. In five cases there was no mesosigmoid, the gut being attached to the posterior wall of the pelvis. A type in which a sigmoidostomy would have been impossible. Several had abnormally long mesenteries, and in one individual, the loop, narrow at the base, could even in the cadaver be approximated to the right costal border, exactly the type which would be expected to predispose to volvulus. The remaining cases varied between the two extremes.

Now whereas there is more or less agreement as to causes operating to produce volvulus of the sigmoid, when one seeks for explanations for the production of volvulus of the small intestine the converse is true. One has but to refer to a series of articles to find how varied are the explanations given of this very serious condition. The blame is usually placed upon the presence of adhesions, or upon abnormalities in the length of the mesentery or bowel. Frequently it is ascribed by analogy to the causes operating in the production of the more common form. Thus Nothnagel:—

"Generally speaking, the conditions that favour the development of axial rotation in the small intestine are the same as those that determine volvulus of the large intestine. In both instances the part of the mesentery that causes the rotation must be abnormally elongated between its origin and its intestinal attachment." And again:—"Abnormal length of the intestine or of parts of the mesentery favours the production of volvulus; in fact, volvulus cannot possibly occur unless such an anomaly exists."

Bowlby and Andrews in their textbook say:—"Volvulus of the small intestine in met with only in connection with previous peritonitis and adhesions of loops of bowel."

Van Hook and Kanavel in *Keen's Surgery*:—"It (volvulus) is not often found affecting the small intestine though in the presence of bands or other adhesions it may be noted."

Russell Howard, in his text-book:—"It is doubtful if a normal loop of small bowel can be so twisted, although it is not uncommon when there are adhesions joining pieces of intestine together."

Alexander Miles in *Choyce's System of Surgery*:—"There are usually adhesions which fix the gut and form an axis of rotation."

Allbutt and Rolleston are even more emphatic on the point:—"It must be clearly stated that normal small intestine and mesentery cannot undergo a pathological degree of torsion and that some congenital or acquired deformity of the mesentery, or some adhesion is necessary to render volvulus possible."

A sufficient number of authorities have been quoted to show the extent to which the blame for volvulus is placed upon structural changes. It must be admitted that cases do occur where this obtains, but are these structural changes and anatomic variations responsible for the majority? There are grounds for believing that they are not.

One very striking feature in the incidence of volvulus which is indicated in Guibé's very exhaustive articles is the great variation in the statistics of different observers. Thus in the London Hospital series, referred to above, but four per cent. of the cases treated for intestinal obstruction were due to volvulus, approximately one-fourth of which were in the small bowel, whereas in a series of 153 cases of obstruction collected by Faltin (Helsingfors) 78 (51%) were due to volvulus, of which 22 per cent. occurred in the small bowel. A divergence of this extent cannot be explained by mere chance.

Among authors reporting a high incidence of volvulus we find the following:—

	Percentage of intestinal obstruction due to volvulus, all forms	*Relative percentage of volvulus of small intestine*
Eiselsberg at Koenigsberg	22	—
Albeck in Denmark	30	80
Rutkowski at Cracow	38	40
Bergmannat Riga	42	40
Philipowicz at Czernovitch	45	25
Faltin at Helsingfors	51	22

It will be recognized that most of these represent regions bordering the Baltic Sea. peopled by Scandinavians, Finns, Russians and Poles, and it would appear that two races, the Slavs and the Scandinavians show a particular predisposition to the disease.

Kuettner and Faltin have drawn attention to the diet of these peoples, vegetarian from early childhood by reason of economic and other conditions, the diet of the Finns, for example, consisting largely of potatoes and sour bread.

Grueber and Kuettner sought an anatomic cause for this racial predisposition and believed they had evidence that the Russians have longer intestines than English, French or German subjects. Tarnetsky, Dreike and Rollssenn on the contrary were unable to establish any pertinent anatomical differences in the intestines of the various races of Europe, differences in length of bowel or of mesentery.

From these observations Guibé concludes that a bulky indigestible diet plays a very important part and that this by producing atony and chronic distension predisposes to the onset of the condition.

That disturbances in peristalsis play an important rôle, quite in the absence of anatomic abnormalities, may be illustrated by innumerable instances. Thus Strumpell records a fatal case of high volvulus ascribed to severe vomiting induced by a quack remedy for tape worm. Cases have been described following violent muscular effort, such as heavy lifting; following coughing attacks (Kuettner, Morrison); during defecation (Prutz); during micturition (Martinoff); incidental to confinement (Gottshed, Fromme, Morestin).

Stanley relates the case of a child aged five, who after a slight blow on the abdomen developed symptoms of acute obstruction, which ended in death after forty-eight hours; autopsy revealed a volvulus thirty inches from the pylorus. Hawkins describes the finding of a figure-of-eight twist of the bowel in a patient who died from acute obstruction forty-eight hours after a fall from a chair. Pennington narrates the history of a girl of eighteen who died of a twist of the ileum induced by violent exercise; and Turner tells of a boy aged seven who fell from a height of twelve feet against the pole of a boat, two coils of intestine were found in volvulus, one coil about the other.

Let us now consider the series of personal cases which form the basis of this report. It will be observed that in none of the four cases was there undue length of the mesentery nor any evidence of adhesions. A review of the case histories, however, contains certain features which stand out suggestively. In case one is the over-indulgence in a hearty, late-evening meal after a day of strict fasting, followed by the development of a volvulus well up in the small intestine; here active peristalsis in the bowel, distended above by food, collapsed below by fasting may have induced the twisting. In the second case the following explanation suggests itself—that the patch of ecchymosis on the abdominal wall was due to a frostbite of sufficient intensity to lessen the vitality of the underlying bowel; the giving copiously of fluids in the hope of increasing the elimination of absorption products from the gangrenous extremities distended the coils, and the increased peristalsis above what was essentially an adynamic ileus threw the gut into its abnormal position. A similar explanation may suffice for the third case where, after a heavy dosage of morphine, the administration of castor oil induced active peristalsis and led to the kinking. In the fourth case a mechanical obstruction in the sigmoid with a grossly distended colon, and an enormous amount of purgative herb remedies combined to play a corresponding rôle. The subjoined table summarizes the findings.

PROXIMAL BOWEL		DISTAL BOWEL
Peristalsis active		*Peristalsis inactive*
Case 1.—Bowel distended by heavy meal.	VOLVULUS	Bowel inactive from starvation.
Case 2.—Bowel distended with forced fluids.		Bowel paralytic from frost-bite.
Case 3.—Active purgation with castor oil.		Bowel paralytic from morphine.
Case 4.—Active purgation and bowel distension from purgative herb remedies.		Bowel mechanically obstructed by annular carcinoma.

All four cases have this in common that in each we seem to have a distal bowel inactive from one cause or another, with the proximal bowel thrown into unusual peristaltic activity, thus producing an antagonism which would appear to provide ideal conditions for the development of the torsion.

In discussing the part played by peristalsis in the production of volvulus, mention should be made of the recent investigations of Carey, the results of which may be very far-reaching. Carey has shown that in the dog, cat, sheep, cow and pig the muscular coats of the small intestine, heretofore described as inner circular and outer longitudinal, are in reality arranged in spirals, the inner coat as a very close spiral, the outer coat wound in a more elongated spiral which makes a complete turn every 20 to 50 cm. or more. This arrangement imparts a screw-like action to peristalsis. Whether the results of these investigations will shed further light on the production of volvulus remains to be seen, but they are certainly very suggestive.

Summary

A consideration of the literature and of the cases here recorded seems to justify the conclusion that we must revise our current teaching that volvulus of the small intestine can occur only in the presence of adhesions or other structural abnormalities of the intestinal tract. Greater emphasis must be placed on disordered peristaltic action, leading to a relative antagonism between adjoining segments of bowel, unequally filled.

THE EVIDENCE OF ORGANIC HEART DISEASE.*

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I HAVE selected this subject in order that I may discuss with you the evidence upon which to base a reasonably correct diagnosis of organic heart disease, in so far as it applies to patients who are not too ill to consult you in your office. On this basis I shall not refer to acute inflammatory affections such as carditis, endocarditis and pericarditis, nor to cases of severe heart failure, both of which groups offer no special difficulty in the recognition of the cardiac factor, although individual features of the case may offer diagnostic difficulties. I do not propose to deal with the subject exhaustively, nor to deal with the evidence which differentiates the various heart lesions from one another. I shall simply attempt to assist you in answering one question—does organic disease exist, or does it not? This is the chief difficulty to be overcome by the general practitioner, and I wish to consider and weigh the evidence from his standpoint. Upon him rests and always will rest, the great responsibility of giving common sense advice to ninety-nine out of every hundred patients, who seek medical help for symptoms of heart disease, real or fancied.

In military practice, we had much statistical information of the importance of cardiac cases from the standpoint of numbers. Lung cases formed the largest medical group, and heart cases formed the second largest group, and errors in diagnosis were very numerous. In civil practice we may safely state, even in the absence of statistics, that heart cases form a large and puzzling group.

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*Read before the Hants-Colchester Medical Society, November 21st., 1922.

No question is heard more frequently in the consulting room than, "Doctor, how is my heart?" The following quotation from Sir William Osler's monogram on Angina Pectoris, while made in reference to Angina Pectoris, applies equally well to heart cases in general. He says, "There is no group of cases so calculated to keep one in a condition of wholesome humility. When you jostle against a hale, vigorous specimen of humanity, who claps you on the back and says, 'The deuce take you doctors, I have scarcely yet got over my fright,' you would like to forget that five years before, you had almost signed his death warrant in a very positive diagnosis of Angina Pectoris vera. On the other hand, Mr. X. has left you with a full assurance that his cardiac pains are due to overwork or tobacco, and you have comforted his wife, and lifted a weight of sorrow from both, by your favourable prognosis. With what sort of an appetite can you eat your breakfast, when one week later you read in the morning paper the announcement of his sudden death in a railway station. Or take another aspect, poor Mrs. Doe has gone softly all these years in the bitterness of her soul, since you took that grave view of her vasomotor or hysterical angina." The question of organic heart disease is one of the greatest importance, and has to do not only with the welfare of patients, but in a very real sense with the reputation of physicians, and is worthy of serious attention. I shall therefore attempt to point out some of the pitfalls which lie in the path of the diagnostician in his efforts to make as few mistakes as possible.

We have all experienced the humiliation which accompanies a tumble on a slippery sidewalk. I know of no stronger incentive to make one walk cautiously in future. The desire to walk upright is intensified if the fall happens to have been witnessed by our intimate friends. In the diagnosis of disease, nothing compels one to exercise increased care more than a diagnostic tumble. Here again, the greatest stimulus is at work when our colleagues have witnessed the fall. In both cases there are those who look on with amusement, those who find pleasure in kicking you in the ribs, and those who lend a helping hand, and help to soothe the sting of the fall. Much can be learned from the survey of the more common diagnostic errors. It is convenient to consider them in two groups. The errors in the first group are due to a failure to recognize signs and symptoms which have a high value in diagnosis, and they result in a failure to diagnose disease when it is actually present. The points to emphasize are as follows:

1. *Diastolic Murmurs.*—Many of these are missed because they are low pitched. In acoustic terms, they are near the lower border of audibility, and are exceedingly difficult to hear.

2. *Presystolic Murmurs.*—Some of these are not properly timed by the observer. Others escape notice on account of low pitch and short duration. In both cases the difficulty is overcome in a measure by examining the patient in a very quiet place, by asking the patient to hold his breath, preferably at the end of expiration, and by examining the patient in various positions, sitting, lying, standing, after exercise and on the left side. These murmurs have such a high value as evidence of organic disease, that their recognition is very important. They are so seldom functional, that in practice they should always be regarded as organic. They may be heard at one time and not at another, a feature which has been erroneously regarded as evidence of a functional nature. One positive finding is worth more than several negative findings, provided that the abnormal sounds are unmistakable, and are not located in the end of the stethoscope, or in the cerebral cortex of the observer.

3. Symptoms such as breathlessness, præcordial pain, fatigue in those past middle life. The absence of physical signs often puts one off the track, when a careful analysis of subjective symptoms permits of no other explanation than a cardiac one.

The errors in the second group result in a diagnosis of organic disease when it does not exist. They are due to wrong and excessive values being placed on certain signs and symptoms. This is probably the larger group, and in many respects the more serious. It is exceedingly common to meet patients who have been told by physicians that they have heart disease of varying degrees of seriousness, and a careful weighing of evidence reveals that no disease is present. The effect on the patient is often disastrous, and results in a state of semi-invalidism, due in part to suggestion, and in part to the fact that the patient is deprived of the benefits of exercise incident to sport, or the activities of a normal healthy life. It should be noted in passing, that such a patient will be cured of his symptoms, if he be convinced, not merely told, that there is nothing radically wrong. The points to emphasize in this group are as follows:

1. Systolic murmurs. There is no doubt that systolic murmurs are frequently present in normal hearts, and this statement is borne out by numerous post-mortem observations. It has been said with some degree of authority, that fifty per cent. of such murmurs are not due to organic causes. It is little wonder that they are responsible for bitter controversy and injustice, especially in life insurance work and pension adjustments, when in the hands of many physicians, a murmur or other abnormal sound is always interpreted as evidence of organic disease. How can we solve this dilemma? There are two helpful rules—First, regard all systolic murmurs in the pulmonary area or with maximum intensity in that area as not organic in the absence of signs of congenital heart disease; Second, if the murmur is heard in mitral or aortic area, look carefully for other signs of organic disease such as hypertrophy, thrills, diastolic and presystolic murmurs, œdema and other signs of heart failure; also inquire for a history of rheumatic fever, and base your opinion, not on the systolic murmur, but on the other evidence present.

2. Irregularities which disappear with exercise are either premature beats or sinus arrhythmias, and do not indicate organic disease.

3. A diffuse impulse is often seen in nervous individuals, and is frequently regarded wrongly as evidence of dilatation.

4. Symptoms such as pain over heart, palpitation, breathlessness, syncope, weakness in young people, are frequently wrongly interpreted as evidence of organic disease.

5. Myocarditis and fatty heart are often diagnosed on insufficient evidence.

Other points might be mentioned here but these are the most common.

It may be profitable to dwell for a moment on the causes of these diagnostic errors:

1. Imperfect knowledge of the fundamentals of diagnosis accounts for many, and the remedy is obvious.

2. Hasty and imperfect examinations in the hurry and flurry of a busy professional life, result in a failure to collect all the data, and are responsible for errors in the hands of those who are quite familiar with the essentials of diagnosis.

3. Lack of confidence in findings is a common cause in early years of practice, and is overcome only by experience. In a certain type of diagnostician, there is also a false confidence or cock-sureness, which leads one into the most absurd errors. Inexperienced observers often hear sounds which do not exist.

4. Lack of standards for estimating the degrees of hypertrophy, for measuring the intensity of heart sounds, and for measuring the strength of the apex beat, is a difficulty for which we are not to blame.

5. The assessing of signs and symptoms at a wrong value is overcome only by reasonable familiarity with the whole subject of heart disease.

6. Another factor is psychological, and is explained by noting what happens in a game of chess. One may ponder over the board for a long time, seeking a solution of some problem, and allow a piece to be seriously threatened before one's eyes.

Similarly, in the more complex game of diagnosis, a simple and fundamental point is sometimes ignored while one has his vision focussed on some other feature of the case. How often have we heard of the organic heart treated for tuberculosis in a sanitorium, or the tuberculous patient treated for neurasthenia, or the tabetic operated on for gastric ulcer, when the evidence is staring the diagnostician in the face.

We may now pass on to the consideration of the most reliable evidence of organic disease. It consists of certain signs and symptoms which have been correlated with pathological findings, checked up repeatedly by many observers, and have been handed to us with a certain value.

which is seldom an absolute value, and in some cases permit of different interpretations. It should be remembered that the man who can make one hundred per cent of correct diagnoses has not yet been born, and the goal to be attained is a high percentage of correct ones. It is convenient to divide the evidence into two groups, first that which should be assessed at a high value, and second that which should be assessed at a low value. In the first group are placed:

1. Hypertrophy, which in turn is based on (a) position of apex beat, (b) left border of heart, (c) forcible apex beat, (d) orthodiagram, (e) presence of other signs of organic disease.

2. Diastolic and presystolic murmurs are organic in ninety-eight per cent. of cases. A pulmonary or Graham Steele murmur is a rare finding, and this illustrates a principle that if any sign is organic in a high, say ninety-five per cent., and functional in say five per cent., it should be assumed to be organic unless the evidence to the contrary is very strong.

3. Irregularities which are maintained after exercise are due to fibrillation.

4. A pulse rate of thirty-five or under, means heart block or Stokes-Adams' syndrome.

5. Angina Pectoris vera should be assessed high.

6. Signs of definite failure such as œdema, orthopnœa, venous engorgement, enlarged liver.

7. High blood pressure, one hundred and eighty or over, carries with it a diagnosis of cardiosclerosis.

8. Thrills, if definite.

9. Pulsus alternans, Cheyne-Stokes breathing, paroxysmal tachycardia.

10. Definite clinical pictures such as aneurysm, endocarditis, congenital disease. A history of rheumatic fever or of syphilis are valuable supporting evidence.

The following signs should be assessed at a low value: Systolic murmurs; reduplication, accentuation and feebleness of heart sounds; diffuse impulse; irregularities which disappear with exercise; exocardial sounds or sounds of doubtful origin; moderate rises in blood pressure; symptoms which constitute the effort syndrome; syncope, usually not due to heart; palpitation; pallor; cyanosis, due to many extra cardiac causes; bradycardia and tachycardia.

A sign in group (1) should be capable of demonstration, if not, it should be placed in group (2) for assessment purposes. A diagnosis is seldom made on one sign alone. Some reference should be made to the part played by special instruments in furnishing evidence of organic disease. The important ones are the polygraph, the electrocardiograph and the orthodiagraph. All these have a prominent place in cardiac diagnosis, but it is important for the general practitioner to know how near he can get to correct values without these special aids. In recent years, it is rare to find in the current medical publications, an article on heart disease, which is not clothed in electrocardiographic language, only intelligible to the few who are familiar with electrocardiographic work. Of the eight thousand physicians in Canada, it is safe to state that not more than eighty, or one per cent. can follow with any degree of profit, the clinical deductions of the electrocardiographer. What about the other ninety-nine per cent? This equipment is not, nor ever will be, available to them, nor will the benefits which they confer, be directly available to ninety-nine per cent. of people who suffer from heart disease. Consequently we should know how far we can travel without them. I do not wish to give the impression that I undervalue these instruments. They have contributed a great deal to our accurate knowledge of certain heart conditions, and rank among the most ingenious contrivances which modern medicine has discovered. In many cases, however, they have enabled us to associate certain conditions with signs and symptoms in such a manner that we can recognize them with confidence without their aid. Auricular fibrillation can be recognized in ninety per cent. of cases, or more, by bedside evidence. Complete heart-block is easily recognized in most cases. No one has emphasized more clearly than Sir Thomas Lewis himself, that the practical problems of cardiology must be solved by the application of rules which can be used by general practitioners. In Colchester, where all this equipment was available, it was only resorted to in a small percentage of cases. Whatever has been accomplished by these special methods in the way of benefits to heart sufferers must be dispensed through the medium of the general practitioner.

The following points may be relied upon to enable the general practitioner to recognize the various irregularities without special instruments of precision:

1.—*Sinus Irregularity*:

Seen in young people—under thirty.
Beats equal in volume but not in time.
Radial and apex beats correspond.
Disappears with exercise.
The irregularity repeats itself in a regular manner.

2.—*Premature Beats of Extra Systoles: Common.*

Dropped beat at radial pulse.
A premature beat heard at apex during pause.
Disappears with exercise.
May be described by patient.

3.—*Heart Block*: *Rare.*

(a) Partial.
Dropped beat at radial pulse.
Complete silence during pause.
Not affected by exercise.

(b) Complete.
Slow pulse, thirty—thirty-six.
Attacks of loss of consciousness.
Epileptiform convulsions.

4.—*Paroxysmal Tachycardia*:

Abrupt onset of rapid regular rhythm, which lasts for a variable time—a few seconds to many hours. Abrupt restoration to normal rate.

5.—*Pulsus Alternans*:

Every second beat feeble, but no change in rhythm; seen only in cardio-renal disease.

6.—*Auricular Fibrillation*:

The beats are unequal in time and volume.
If this irregularity is associated with signs of definite heart failure, the diagnosis may be made with confidence.
If no heart failure is present, give patient sufficient exercise to increase rate to one hundred and twenty or more. If irregularity is maintained, the diagnosis may be made with confidence.

7.—*Auricular Flutter*:

A persistent rapid regular rate with signs of heart failure in absence of extra cardiac causes such as fever, may be flutter. This is so difficult to recognize by simple methods that it is probably better not to attempt to diagnose it. The cases will then fall into fibrillation group, or be treated as cases of failure.

This concludes my survey of the evidence of organic heart disease. Attention to the above points will permit a very high percentage of correct diagnoses.

Let me again emphasize the central thought in my mind. It is, that in the very nature of things, the general practitioner is responsible for the care of ninety-nine per cent. of the cardiac patients, and he should be familiar with the evidences of disease which is easily within his reach. He should realize that he is able to assess values correctly in a surprisingly high percentage of cases, and that he must not allow his mental vision to be blurred by the dazzling brilliance of modern laboratory methods. He must take advantage of all which these special methods have to offer, but not allow them to supersede the simple clinical methods, especially when the latter are the only methods available.

Acute Pancreatitis in Children.—Horace B. Anderson, Johnstown, Pa., reports a case which he regards as unique in that (a) it is a case of acute haemorrhagic pancreatitis in a child, aged four years; (b) there were no lesions of the gall bladder or biliary passages; (c) there was a well defined cirrhosis of the liver, and (d) there was a well defined acute duodenitis present. The child was admitted to the hospital because of pain in the abdomen, vomiting and constipation. Two days previously, the child ate a dinner consisting largely of cabbage, but went to bed that night apparently in normal health. At 4 a.m., she complained of abdominal pain, and soon she began vomiting. The vomitus contained food particles eaten the day before. A physician at 9 a.m. found the child very ill, but without much fever. He prescribed cathartics and something to ease the pain. The child became progressively worse: the abdomen became more distended and rigid, and vomiting continued. She did not have a bowel movement for two days. The patient had one bowel movement, consisting of a dark bluish, semiliquid material, just before she died, one hour after admission to the hospital. While in the hospital the temperature was subnormal, the pulse very weak and rapid, and respirations accelerated.—*Jour. Am. Med. Assoc.*, April 21, 1923.

IMMUNITY IN TUBERCULOSIS

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In presenting some of the facts, theories and hypotheses in reference to immunity and the tubercle bacillus, one is struck by the many contradictory conclusions different investigators have come to in the past in interpreting the same phenomenon. The subject is full of pitfalls and while a few facts are apparently well established, no one can as yet be dogmatic on the subject.

Natural Immunity—No mammal is, as far as is known, absolutely immune to tuberculosis. Some are more susceptible than others, *e.g.* cows and pigs are much more susceptible than horses and goats, but all can be infected with the tubercle bacillus if introduced in sufficient dosage. It has been tried at different times to transfer this natural immunity by injecting serum of relatively immune animals into animals less immune. So far this has never proved successful, that is, immunity cannot be transferred from one animal to another in this way.

Racial Immunity—Aboriginal tribes are, as is well known, more susceptible to tuberculosis than the white races. The question here is, of course, one of early exposure to infection *versus* no exposure and will be discussed under "acquired immunity," but various white races seem to show varying degrees of susceptibility. Italians and Jews are less susceptible than Irish or Swedes. The Framingham survey showed that while the incidence of tuberculous disease, either active or arrested, was about 2% in the general population, the Italians showed an incidence of 0.5% and the Irish about 5%. Is it because of the prolonged exposure to tuberculosis that this immunity has developed among the Italians? If this were so one would think that the children with a family history of tuberculosis would be more immune than those with none. Yet Raymond Pearl has shown that the person with a family history of tuberculosis is six times more likely to develop tuberculosis than the average population. With regard to racial immunity the figures of Cummings in regard to the incidence of tuberculosis among native troops in France in contrast to its incidence among the British soldiers are most interesting and instructive.

Cummings' statistics show in a very striking manner that individuals from countries where tuberculosis is rare, exhibit, when exposed to infection, a susceptibility incomparably greater than that of individuals from countries where the disease has long been widely prevalent.

The British troops in France in 1917 and 1918 had an average strength of over 1,500,000.

Total number of cases of tuberculosis in 1917—1,660
Total number of deaths—91
Total number of cases of tuberculosis in 1918—1,221
Total number of deaths—74

The total average strength of Cape Boys and Kaffirs was 11,000.

Total number of cases of tuberculosis in 1917—156
Total number of deaths—69
Total number of cases of tuberculosis in 1918—174
Total number of deaths—113

That is, there were thirteen times as many cases developed among Kaffirs and Cape Boys as among the British troops. The contrast of fatal cases was equally striking. 165 deaths from 2,881 cases, or 5.7% mortality amongst the British; 183 deaths from 327 cases, or 56% mortality amongst the Africans.

Another fact is important, namely that the type of tuberculosis found amongst the native troops was what might be styled the infantile type; *i.e.* a fulminating pneumonic and caseating tuberculosis, or miliary tuberculosis such as is found in infants below two years of age dying of tuberculosis. These figures have, of course, a definite bearing upon the subject of acquired immunity.

Acquired Immunity—In the ten years succeeding the discovery of the tubercle bacillus by R. Koch, an immense amount of work was done by various workers, especially in Europe, in an effort to produce immunity to tuberculosis. In 1886, Marfan, a Frenchman, in a paper entitled, "Concerning the Immunity conferred by the cure of a Local Tuberculous process against Pulmonary Phthisis," maintained that people, who had completely recovered from tuberculous disease of the lymph nodes, or who showed entirely healed scars of lupus, never fell ill with pulmonary tuberculosis. In August, 1890, Robert Koch announced the discovery of what was first known as "Koch's lymph" and afterwards given the name "Tuberculin."

In his first communication Koch gave no description whatever of his remarkable remedy. He merely said that it was "a substance which, when inoculated into a guinea pig, renders this animal insusceptible to inoculation of the tuberculous virus. This same substance, in guinea pigs that are already afflicted with advanced and generalized tuberculosis, brings about a complete arrest of the development of the disease although the animal organism does not suffer the least harmful effect under the influence of the remedy." Purposefully or otherwise, Koch invested what if true would have been the greatest discovery in the history of medicine with a great deal of secrecy and mystery, and left the world in complete ignorance of the origin and constitution of his remedy. A few months later he published a more detailed description of it and of its effects. It was a clear, brown liquid that was easy to keep although dilutions of it would deteriorate unless these were made in a special way. Koch then went on to describe how it should be administered to man and animals, and described the effects it produced in both the healthy and the tuberculous.

"The excitement that followed this astonishing announcement was extreme. Medical men from all over the civilized world flocked to Berlin to witness the effect of the remedy and to obtain some for their own use if possible. A thousand dollars were freely offered for a bottle which contained about a teaspoonful, and the substance could not be procured at that price from those who had been fortunate enough to secure some. Crowds paraded the streets of Berlin chanting rhymes in Koch's honour and shouting his name." . . . . .
"It was August 4, 1890, when Koch announced that by the use of a secret and undescribed substance he had been successful in producing a cure for tuberculosis and in immunizing animals against further infection. It was November 22, 1890, when Trudeau announced in the *Medical Record* that he could not immunize animals against tuberculous infection with the filtered and sterilized cultures of tubercle bacilli. Trudeau published every detail of the preparation of his materials that were used for immunization. As was discovered later, there was no essential difference between Koch's substance and Trudeau's. Yet one man had made remarkable claims while the other confessed that in his hands the substance did not have the desired effect. Trudeau published negative results and his paper was passed over without notice, Koch made startling, positive assertions and his announcement created a furore," (A. K. Krause).*

Koch's phenomena—Koch, in his experiments with tuberculin and with the effect of re-infection of animals already tuberculous, made a very important observation. This is known as Koch's phenomena. "If," says Koch, "one inoculates a healthy guinea pig with a pure culture of tubercle bacilli, then, as a rule, the wound closes over and within the first few days seems to heal. In the course of from ten to fourteen days a hard nodule arises which soon breaks down and, until the animal's death, forms an ulcerating point. But the case is totally different if one re-inoculates a guinea pig that is already tuberculous. Best suited for such a purpose are animals that from four to six weeks before had been inoculated with positive results. In such an animal the small inoculation wound closes over at first; but no nodule forms and on the second or third day there takes place a peculiar alteration at the point of inoculation. This becomes hard and assumes a dark colour; and this condition is limited not to the point of inoculation itself, but extends out into the neighbourhood for a distance of about 1 cubic centimeter in diameter. In the succeeding days it becomes even plainer that this changed skin is necrotic; finally, it shoughs and a shallow ulcer remains which as a rule heals quickly and permanently without infection of the regional lymph nodes."

The importance of this observation lies in the fact that animals already tuberculous react in an entirely different way to a second infec-

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*A. K. Krause—"Essay on Tuberculosis," *Journal of Outdoor Life*—p. 129, May, 1919.

tion. The importance of this observation was not apparently realized by Koch whose head was apparently filled with the possibilities of tuberculin. Others did realize the importance of this fact. In 1894, Trudeau and de Schweinitz experimenting on rabbits, produced immunity in them to virulent human tubercle bacilli by a previous inoculation with a culture of avirulent (R) living tubercle bacilli. R1 culture is a culture of an avirulent strain of human tubercle bacilli that was grown by Trudeau many years ago and is a standard avirulent strain used in laboratory work in many laboratories still. Why it became avirulent has never been explained. In 1897, Trudeau reported his work with R1 tubercle bacilli to the British Medical Association at Montreal. He showed that thirty-six animals unprotected by previous R1 inoculation, but inoculated with virulent human bacilli lived on an average 57.2 days. Sixty-six animals, receiving previously a protecting inoculation with R1 and then injected with virulent tubercle bacilli, lived an average of 154.3 days. Since then better results than this have been obtained.

About the time of Trudeau's work and in the ten years following it, an enormous amount of work was done by many investigators with various acid-fast organisms. There are three forms of pathogenic acid-fast tubercle bacilli, *viz.* human, bovine, and avian. There are besides these, a large number of acid-fast organisms which are non-pathogenic, found in hay, dung, and various cold-blooded animals such as ground worms, turtles, fishes, etc. It was thought possible, and some experiments seemed at first to prove it, that there might be a transmutation from one form to another. More careful observation has shown that there is no such thing as transmutation. It was shown by Koch that animals infected with repeated doses of dead human bacilli would agglutinate any acid-fast bacillus. Tuberculous guinea pigs will show a positive skin test to extracts of grass, milk, dung and butter bacilli. The so-called immune bodies, *viz.* precipitins, agglutinins, aggressins, opsonins and complement fixing bodies have little to do with immunity to tuberculosis. These bodies can all be formed in the serum of animals after giving repeated doses of tuberculin, yet these non-infected animals, no matter how much tuberculin they have received, show no immunity to tuberculosis.

The work of Alf Moeller with living acid-fast bacilli is most interesting. Moeller believed that non-pathogenic acid-fast bacilli would produce immunity against pathogenic tubercle bacilli. He inoculated himself with the blind worm bacillus at 6 to 11 day intervals. After a few weeks he inoculated himself with a 50th of a loop of living virulent tubercle bacilli. He produced no reaction. In the next two months he lost 15 lbs. which he gradually regained, but he did not develop any clinical tuberculosis. Moeller's work, repeated on animals, did not show that any absolute immunity could be conferred, though there is some evidence that there was a less severe type of the disease. Moeller later abandoned this method of immunization as unfruitful; it was afterwards taken up by Friedman to his great financial benefit, though without any benefit to the patients who parted with their cash.

Behring's Bovo-Vaccine—In 1901, Behring vaccinated cattle with living, dried, human bacilli and produced an immunity to bovine tuberculosis. This was tried on thousands of cattle. The cattle became no doubt immune, but the immunity did not last longer than two years. Results were very variable, possibly because the tubercle bacillus in some of the various lots of the vaccine were dead.

Koch's Tauraman—This was a modification of Behring's method. Cattle upon whom it had been used became resistant to a large single inoculated dose of virulent tubercle bacilli, but became infected when exposed to tubercle bacilli in the natural way.

Calmette's work—The recent work of Calmette upon cattle has resulted in what is probably the most satisfactory immunity yet produced. He has produced an immunity by the vaccination of calves with living tubercle bacilli, which immunity has lasted for a number of years. His further work will be watched with much interest.

All the above leads us to the following conclusions. No satisfactory immunity has ever been obtained from: (1) Dead tubercle bacilli of any type; (2) Living bacilli of as low a virulence for mammals as are avian bacilli; (3) Living or dead non-pathogenic acid-fast bacilli; (4) Tubercle bacilli changed by physical, chemical or biological agents; (5) Soluble or insoluble derivatives of the tubercle bacilli, (dogs, goats, etc.) or the serum of those artificially treated with tubercle bacilli, or derivative of these.

Conclusion—Only the tuberculous are immune. This conclusion that the only ones who show an immunity are those who carry living tubercle is borne out by the observation of Cummings on native *versus* British soldiers. It is also borne out by observation of the Von Pirquet test. Tuberculosis is a very fatal disease in children below two years of age. Children, as a rule at this age, exhibit a negative Von Pirquet reaction showing they have not as yet received their early protective inoculation. Tuberculosis diminishes in fatality as chances of small infection occur. It does not, however, explain why the most immune period of life is from five to fifteen years, while the incidence of tuberculosis increases at about eighteen to twenty years.

Another rather interesting fact in connection with the Von Pirquet test is that it disappears during infectious diseases, *e.g.* measles, in which the resistance is lowered. It is probable that relative immunity varies a great deal, depending on such factors as acute infections, etc. It is also evident that immunity from tuberculosis is not a humoral affair but rather resident in the cells; Allergy or sensitiveness to tuberculin is evidently humoral, but the development of the precipitins, agglutins, etc., has evidently little to do with our resistance to the disease.

In the study of immunity to tuberculosis it is possible we have been paying too much attention to the tubercle bacillus. It has been shown that the toxæmia of tuberculosis is not altogether due to the poisons of the tubercle bacillus, but rather due to the absorption of minute quantities of caseous or necrotic tissue. The symptoms of tuberculosis may be produced by the absorption of these non-specific poisons. The tubercle bacillus or the products of the growth of the tubercle bacillus in some way produces caseation. The absorption of these caseous products produces the disease and lowers the general resistance so that the tubercle bacillus is able to produce more caseous areas. The question remains: "Is the solution of immunity to tuberculosis to be found in something that will produce an immunity to the products of caseation, non-specific in its character?"

THE PSYCHOLOGY OF NEUROSES

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PERHAPS the greatest difficulty for the general practitioner, in approaching the study of neuroses, can be traced to the lack of agreement among psychiatrists as to what clinical disorders should be grouped under the heading of "neuroses." The terms used to denote the neuroses, hysteria, neurasthenia, psychasthenia, anxiety neuroses and even those applied to the two main groups, neuroses and psychoneuroses, have no uniformly accepted connotations. Every description of these "diseases" draws in, sooner or later, some theory which determines the symptomatology, *e.g.*, a dissociation theory, a conflict theory, a toxin theory, an endocrinogenic theory, a degeneration theory, an autonomic disorder theory; each one supported by some facts, each one apparently insufficient to account for all of them. In the face of this, it is not to be wondered that the practitioner becomes alarmed at the range of the requisite diagnosis or that he is led to consider that each of the neuroses is protean, with each part of the disorder requiring separate treatment. This is probably one of the facts which have kept him from attempting to deal with these diseases, and have forced him to leave the treatment to the specialist.

Certainly the backward state of psychotherapy cannot be attributed to a dearth of clinical material. Jones contends that neuroses are probably more frequent than any other form of disease. The victims have not usually been called "sick" people, however; they have been known as the drug addicts, the sexual perverts, the kleptomaniacs, the recidivists, as misfits who are unable to adjust themselves to society; or as malingerers. The physician has regarded them merely as social incompetents, and has only recently come to recognize that such disorders were the natural outcome of certain causes which could be discovered and removed by scientific methods. He has accepted the assertions of these people, that they did not know why they did these things, as indicating that there was no cause. They have been known to him, sometimes, as chronic patients, whose ills seemed to cover the whole organic system, but for whom the diagnosis was always negative. Without a doubt the failure of the physician to recognize the real nature of the trouble has reacted to his own detriment, inasmuch as the charlatan, less careful about possible organic complications, less handicapped by devotion to scientific truth has succeeded where the former has failed. The purpose of this paper is to present certain facts of normal and abnormal psychology which will orient the physician in his approach to mental disease.

Out of the complexity of the symptomatology of neurotics we may note the following forms of behaviour as fairly constant:

1.—Disproportionate emotional reaction: the patient seems excited or depressed over some experience, and yet there does not seem to be any sufficient cause in the situation described by the patient. Thus one will experience fear, almost amounting to dread or horror, on hearing church bells ring, or when left alone in a darkened room.

2.—The patient complains of disturbed and restless sleep, often troubled by dreams of a terrifying or foolish nature, of fears and worries from which he cannot rid himself; of the origin of these he can give no account.

3.—There may be physical anomalies of various sorts, such as hemiplegia, blindness, deafness, mutism, anaesthesia, more or less well-localized pains, etc.

4.—The symptoms are unstable and variable. Treatment may be proceeding favourably and physical noxae be almost removed, only to reappear in some other form; for example, visual anaesthesia may be replaced by aphonia.

5.—There is often, in the patient, some mental force which is striving against recovery, or, as we may say, there is "resistance." The patient will rarely agree that this is so, but it is a fact with which all practitioners are familiar. A patient will have important engagements which keep him from meeting his physician; he forgets the doctor's prescriptions, and so on, until the latter feels like accusing the patient of being anxious not to recover.

These symptoms are common to almost all neuroses, though, of course, one or two may be dominant in any particular case. They are all psychological factors and our problem is to account for their appearance in terms of normal or abnormal psychology. If this can be accomplished, then we may expect to find psychological agents of most direct use in the treatment of such disorders.

There are five well known and generally accepted psychological facts which must be adduced to enable us to understand the etiology of neuroses.

1.—*Cause and effect operate as completely and as uniformly in the mental as in the physical world.* This idea, that no mental fact appears without cause, is one for whose clearest enunciation and demonstration we are indebted to the schools of Freud and Jung. Inability to recall a name, errors in writing well known words, failure to recognize our friends, are facts which now, for the first time, are satisfactorily accounted for. Hitherto the explanation has been in terms of some physical analogue, *e.g.* an "overburdened" memory, "slips" of the tongue, or in terms of an assumed heightened synaptic resistance. The insuperable difficulty with the latter theory has been to account for this phenomenon itself; there seems to be no neurological reason why the synapse should show such variability and irregularity in functions, and especially no reason why that particular group of synaptic connections, and not others, should be modified at that particular time.

It is a matter of considerable difficulty, for one who has not made a fairly extensive study of both the normal and abnormal phenomena of mental life, to realize that the evidence is overwhelming in support of a thesis that there are no more accidents in mental processes than occur in any other biological process. This statement does not deny the relatively greater freedom of man's mental life as compared with that of the lower organisms, but it postulates a freedom under law, instead of lawlessness; it substitutes system and order for caprice. These laws are not all known as yet, but enough evidence is available to warrant us in taking the contention made at the beginning of this paragraph as a scientific hypothesis.

If every idea, every emotion, every fancy, every creative act, such as the painting of a picture, is caused by discoverable factors, it then becomes the task of the phychologist to discover the origins, and he does not search far before he finds it necessary to acknowledge that the individual cannot normally give a satisfactory account of all of them. If there is a cause, it must be one of whose existence the individual is unaware or unconscious. If, then, he will hypnotize the patient he may discover that ideas which had apparently disappeared entirely, can be recalled, and thus he may discover facts which will explain the phenomenon.

Each of the characteristics of the neurotic noted above, has, then, an explanation. The emotion is not really disproportionate for the person who shows it; and we call it so only because we do not know all that the situation means to the patient. The terrifying dreams have a sufficient cause somewhere, if it can be discovered; the unstable physical stigmata are so, because of some reason which the physician must disclose, and resistance is a definite response to some situation, perhaps one unknown to either physician or patient.

2.—*No experience is ever entirely lost except through organic causes.* This is another assertion which seems to be contradicted by personal experience. But the difficulty exists only for those who try to narrow life down to those processes and states of which we are conscious. All of us are familiar with the fact that remembering a fact, such as a name, a date, a prescription, is not sometimes possible at will. Ideas seem to be so completely gone that we are unable to recall the name, and yet we know it is not lost; it is on the tip of the tongue, and we believe that it will come back, or that we should recognize it if we heard it. At other times ideas flash into the minds for which we have been searching unsuccessfully for days.

Normally, recall takes place in accordance with the well known principles of association. We think of the name of a certain disease, this recalls the name of a patient who was afflicted in this way, then we start on a long chain of thoughts relative to this individual, his private life, his habits, some mutual friends of ours, and so on. The seeming irregularity of the appearance of these ideas is only apparent; in reality, each successive idea appears when and where it does because it is somehow connected or associated with the idea or experience immediately preceding it. Ideas tend, then, to become organized into groups or systems. The significance of this tendency to our study lies in the fact that ideas which we cannot recall, *per se*, may be recalled by first allowing to pass in review ideas which are somehow linked up with them. This fact of recall through "free association" is the basis of one of the best known methods of psychoanalysis.

But we must recognize that there are some experiences which we seem to be incapable of recalling, even by the use of the association process. Our memory for the events of infancy is a well-known instance; our memory for dreams is likewise very inadequate. Such ideas, not readily revivable, are styled "dissociated." Ordinarily, these dissociated ideas show no independent organization, but in a few cases of great clinical importance they become fused into a separate personality which alternates with the normal one, showing different character traits, different moral and intellectual status, and different habits of life. (The case of Miss Beauchamp reported in full by Dr. Morton Prince in a book entitled "*The Dissociation of a Personality*," is the most complete case study of this type of disorder. Dr. Jekyll and Mr. Hyde is a parallel in fiction). Such facts seem to require the postulation of an unconscious. With regard to the neurotic, all that we need note is that the origin of the disorders may be difficult to reall, because dissociated, and that certain special methods will need to be used to discover the unconscious factors at work.

3.—The third fact is one which is just now receiving its proper attention in normal psychology. It is becoming recognized that both in normal and abnormal minds the emotional accompaniments of ideas determine not only whether we shall recall them, but also how we shall conduct ourselves when they do come into consciousness. Freud and Jung have contended vigourously that the task of the psychologist is not to explain why we remember, since this is a natural function of nerve process, but why we forget, and their researches have led them to believe that the cause of forgetting is the association of the forgotten idea with some emotional experience. Barring organic causes, then, they would say that we forget something because it is emotionally unpleasant, because, therefore, we wish to forget it. This unpleasantness might be due to the fact that society had caused undesirable consequences to follow the expression of these ideas. To the emotionally toned system of ideas psychoanalysts give the name "complex." To the process of actively putting complexes out of consciousness they give the name "repression." Complexes are repressed into the unconscious.

4.—The fourth principle to be noted is that *all mental processes are dynamic, i.e.* they tend to express themselves in action. A simple example may be taken. As we listen to a dispute we find an idea or group of ideas forming themselves in our minds, perhaps the idea that the disputants should be separated. Quite involuntarily we may find that we push ourselves between the two. In the court room we find the lawyer watching not only the responses of the witness, but the more subtle language of his facial and general bodily movements. The interrogator believes, quite correctly, that the witness will often refute, by becoming flushed or pale, or by nervous movements, what seems to be reliable testimony. The witness is not aware that he has done these things, and would have prevented them had he been able to do so. They are, however, the expression of ideas, or attitudes which are at least on the margin of consciousness, if not unconscious.

We are now able to proceed further in our explanation of the behaviour of the neurotic. We have seen that emotionally toned groups of ideas, or complexes, are often dissociated, and repressed into the unconscious, and kept there because their recall has been the occasion of unpleasantness in the previous experience of the individual. Repression achieves a part of its aim; it keeps the tabooed ideas out of consciousness, but it is powerless to prevent these ideas or complexes or dispositions or whatever one may call them, from affecting the behaviour of the individual. We noted above a fact from normal psychology, that, unconsciously, we often give expression to certain ideas, impulses, and tendencies without being aware that we are doing so. Now the anomalies in the behaviour of the neurotic are not very different from these facts. There seems to be no reason for denying to the content of the subconscious the same dynamic character as we find in that of the conscious. The differences which one would expect to find, if we are acting from unconscious reasons, are these, (1) The actions will not be in keeping with the conscious content of the mind. We may give expression to a wish to recover, and zealously assert our desire to be rid of these terrifying dreams, violent emotional disturbances, and quasi-organic disorders, but psychoanalysis has shown that many of the neurotic symptoms are of peculiar value to the patient. He may have a dread of the trench life, hysterical blindness or deafness provide a solution; he may find his vocation in civil life very depressing and repulsive, hemiplegia provides a means of escape; the housewife may rebel to herself at the endless and unrequited toil of the home, she will develop tics or tremors, or will find that she experiences violent pain when bending down to scrub floors. In every case the patient will strenuously deny that there is any *conscious* relationship between the type of disorder, and the situation to which all evidence points as a cause, and the patient is quite truthful in such a statement. The causes are, by this time, not in consciousness, and it usually requires a good deal of courage and self-assurance on the part of the physician to convince the patient that herein is the explanation.

(2) These acts cannot be controlled by the will. It is useless for a physician to advise a patient that his disorder is entirely imaginative and that all that is needed is that he should make up his mind not to be troubled by it. We shall not go into the psychology of the will; all that we need note is that the advice, as stated above, has often been given, and has often been the occasion which threw the patient into the hands of a more sympathetic and less qualified healer. The will refers only to fully

conscious phenomena; the causes of the disorders are definitely not conscious.

The anomalous behaviour may not be a direct expression of the complex, but indirect. Freud found some reason, (for him sufficient), for asserting that dreams are "distorted by a psychic censor," since the expression of the complex would be unpleasant, and would waken us. The anaesthesias, contractures, spasms, paralysis, etc., are, according to Freud, also, at times, indirect expressions of repressed wishes. The direct expression would involve us in conduct of which society would disapprove. The reasons for the specific localizations of the disorders is the problem in point here, and it must be acknowledged that it is a difficult one to explain. Freud contends that the types of physical disorders are not dependent on any local organic weakness, but are somehow symbolic of the repressed wish. Many psychiatrists are not prepared to accept this statement.

Jung is much more successful in accounting for the localization of the physical disorders, when he considers the noxae to be direct expressions of, and to provide him with his best clue to, the content of the complex. To Jung the neurosis is an unconscious solution of an intolerable situation, and the stigmata must be considered as directly symptomatic. Jung also gives us a clear explanation of the "resistance" on the part of the patient to treatment and cure. Unconsciously he does not wish to be cured, because this would only mean a return to the situation from which the neurosis had freed him. Hence the patient develops blindness to escape return to the trenches, bodily pains in order to make it impossible for him to return to his office, he neglects treatment or varies his symptoms, all in an endeavour to avoid the cure which means return to the duties of life, whether civil or military occupations.

It will be of interest here to note that Freud considers that there need be no neuropathic constitution in the patient in order that a neurosis may develop. That this is not the viewpoint of many psychiatrists is indicated in the War Office report on "Shell Shock," in which the following statements occur: "authorities are agreed that in the majority of cases of war neuroses, there already existed a congenital or acquired predisposition to pathological reaction in the individual concerned, and that this constitutional characteristic was of vast importance." (p. 97). Again we read: "in the large majority of persons showing emotional 'shell shock' there was present in the family history or in the personal history, evidence of weakness, instability, or defect of the nervous system." There is strong evidence that Freud's contention is not valid in many cases, but the matter must still be considered as *sub judice*.

5.—One final fact may now be considered. This is what is called in clinical psychology *Libido*. This term has been improperly restricted by Freud to sexual energy; it means vital energy of any sort, of which the sexual is but one form. This libido is, in part, defined by inheritance as to the modes in which it shall operate. Thus, there are certain innate forms of behaviour known as reflexes and instincts, the latter being differentiated from the former by their greater complexity, variability and modifiability. These provide the primary channels for libido occupation. The experiences of life simply extend the number and organization of the outlets. The major instinctive tendencies, *e.g.*, the sexual, parental, pugnacious, and so on, are accompanied by strong emotions.

Society does not allow the free manifestation of these instinctive tendencies, but by custom and taboo leads the child to modify or repress such libido occupations. Because of their strong emotional accompaniments, repression of instincts is a difficult and dangerous process, and one which shows a definite relationship to neurotic disorders. Sexual excitation is, in part, conditioned by external stimuli, in part by internal development. If either group of facts provides stimulation, then the organism must manifest excitement. But society has nowhere placed its taboos more strongly than on sexual activity, and on all ideas relevant thereto. If the early treatment of sex tendencies and sexual imagery has not been one which has provided a proper direction to this libido, then we may expect outbursts at a later period of life. Such manifestations are dreams, phantasies, and disproportionate emotional life. Freud, Jung, Pfister, and Rivers all point out that the childhood experiences are of very great significance in accounting for the adult neurosis; they are not in agreement as to the actual part childhood plays, but all emphasize the importance of careful direction of instinc tive forms of libido expression, whether sexual or otherwise. It may be of value to point out here that investigation of war neuroses has proven that Freud's theory that all neuroses are sexual in origin, is not correct, no matter how widely one interprets the term sexual

Emphasis has been placed, in the latter portion of this discussion, on the importance of the emotional life in determining the repression and the anomalous behaviour. It will be remembered that there are several theories of neuroses in the field, that noted above, an endocrinogenic theory, and an autonomic disorder theory. In the present state of our knowledge of the physiology of emotion we may have to consider the theories as supplementary or alternative, but in the opinion of the writer, continued research on the neuro-physiological basis of emotional life may very well show that the theories are both referring to the same group of facts, and that the only disagreement is one of terminology: one being physiological and the other psychological.

All through this analysis we have been forced to recognize the existence of a subconscious. It is sometimes asserted that psychologists are not in agreement as to whether or not there is a subconscious mind, or as to the laws which govern its action. The latter half of the statement is correct; the other contention is wrong. The attitude of clinical psychologists to the subconscious may be legitimately compared with the attitude of biologists to evolution; no one denies the fact, but the *modus operandi* is far from being settled. Meantime the contention is valid, that a number of the thoughts we have, of the acts we do, and of the emotions we feel have their origin in causes unsuspected by ourselves.

We have now accomplished our first aim; that of accounting for the anomalous behaviour of the neurotics. Starting in every case from the facts of normal psychology we have traced the deviations which lead by short stages over to the abnormal reactions of the neurotic. This analysis has shown that such behaviour is not more mysterious than that which is called normal, and that the primary problem, for one who would understand the abnormal, is that he shall comprehend the nature of normal processes.

It remains for us to note briefly the treatment of neuroses. The foregoing statement of aetiological factors offers direct guidance at this stage. If the neurosis is due to repressed complexes and repressed instinctive tendenoies of strong emotional character, then the problem of the physician is the isolation of these pathogenic factors and their gradual eradication. Either hypnosis or psychoanalysis may be employed for this, but psychoanalysis has certain considerable advantages, and has succeeded where other methods have failed. Space does not permit us an explanation of the technique of treatment; that should be procured from one of the many available texts on the subject. No matter what method is employed the period of treatment will be lengthy and its course one full of disappointments and disillusionments. But because of the fact that we are now able to understand in some degree the mechanism of the disorder, and because the skill of the physician is being so directly challenged by the success of non-professionals, it is certain that much more attention will be given by the profession to these disorders.

One of the chief functions of the courses in psychology, now being offered in medical schools, is to provide the physician with a scientific statement of the methods by which diagnosis and treatment of mental disorders may proceed, and thus enable him to approach neuroses with the same confidence and scientific assurance as has characterized his approach to demonstrably organic disorders.

Congenital Sarcoma of Kidney in a Child of Twenty-Nine Days—Clyde Leroy Deming, New Haven, Conn., reports a case to emphasize (1) the value of complete cystoscopic examination in children; (2) that urograms are just as essential in the examination of infants as in that of adults, and (3) that local anaesthesia may be used for nephrectomy in infants.—Jour. Am. Med. Assoc., April 14, 1923.

ANTIPYRETIC MEASURES

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The Significance of Fever

As to whether fever temperature in itself is usually beneficial we are still uninformed. In pursuing the history of this question, one meets with all shades of opinion. At one extreme is the doctrine of the ancients that fever constitutes a beneficial "purging by fire"; at the other is the belief once held by the Liebermeister school, that all fever patients should be subjected to drastic cooling by hydrotherapy.

One definitely established fact is that the metabolic rate in various fevers increases in conformity with the law of van't Hoff. This law states that each increase of 10° C. augments the velocity of chemical reactions to an amount varying from two to three-fold. This has recently been demonstrated in detail by Du Bois[1] and his collaborators for malaria, erysipelas, tuberculosis, acute arthritis and other febrile conditions. Incidentally Du Bois' results afford an excellent example of the application of chemical laws to biological processes.

Such stimulation of metabolic activity by fever temperature, if significant at all, would appear to be somewhat wasteful of energy and perhaps of tissue. Older experimenters have shown that antitoxins and other protective bodies in some cases develop in animals more rapidly if the body temperature be artificially raised.

Indications for Antipyresis.—In spite of this uncertainty as to the optimum body temperature in infectious disease, there must be recognized three definite indications for the employment of antipyretic measures:—(1) etiotropic; (2) symptomatic; (3) hyperpyrexia, or dangerously high body temperature. Malaria may be taken as an example of the etiotropic indication—the antipyretic effect of quinine being of far less importance than the destruction of the parasite. In the case of the symptomatic indication, temperature reduction is really needed, perhaps not for its own sake so much as for the consequent relief of discomfort. In hyperpyrexia, *e.g.*, with temperatures of 106° F. and above, antipyresis is the main object.

The antipyretic measures employed to-day are cold applications and drugs.

Application of Cold.—Cold is not applied with the same degree of intensity as was urged by Leibermeister several decades ago, and the reason for the substitution of cool sponges and similar measures for the cold baths has become more apparent with the increase of our knowledge of the heat-regulating mechanism of the body. Cold applied to a homoiothermic animal exerts simultaneously two opposite effects. It abstracts heat from the body in the same way and according to the same laws that apply to its relation to any object of a higher temperature; the fact that has been frequently overlooked is that in the homoiothermic animal it simultaneously arouses the *regulation against cold.*

In the regulation against cold, processes of increased heat production and decreased heat elimination are set up, with the result in the normal animal that a practically constant body temperature is maintained in spite of an adverse environment. When the external cold becomes excessive or the reserve stores of bodily energy exhausted, the protective mechanism breaks down and the body temperature falls.

Now, in fever we have a pathological condition involving an abnormally active regulation against cold. A moderate environment is interpreted by the temperature-sense nerve endings in the skin as too cold. The protective mechanism is aroused in absence of its need, producing the phenomenon of a chill. Blood of a high temperature must now pass through the nervous centres of heat regulation (especially the basal ganglia of the brain) before the mechanism of protection against cold becomes inhibited.

If we employ very cold applications in fever we stimulate a mechanism which is already hyperfunctioning, and only accomplish the end sought by breaking this mechanism down. While the same reasoning applies to the cool or tepid sponges, a certain amount of heat may be abstracted with care by these procedures—often to the benefit of the patient—without arousing the protective mechanism to the point of exhaustion. Friction employed with cool sponges is said to bring more blood to the surface, and in this way to promote cooling. The rubbing procedure may, however, arouse only enough of a response to compensate for the extra heat which it introduces. Passive exercise with cool sponges is said to be beneficial by preventing congestion. Incidental to the application of cold to the body surface, there is apparently aroused an increase in the tone and activity of smooth muscle, resulting in increased peristalsis and the like.

Antipyretic Drugs.—Drugs, on the other hand, when employed for the reduction of fever temperature, may interfere less than does hydrotherapy with the normal processes of the body. Here we do not arouse the regulation against cold but employ measures, which if rightly used, seem to restore the normal threshold of this protective mechanism without untoward side actions.

Antipyretic drugs were formerly classified according to whether they acted by decreasing the production or by increasing the elimination of heat. Quinine was cited as acting in the first mentioned manner. This teaching, however, was based upon insufficient evidence in which the action of quinine in large doses, as a general protoplasm poison, was unduly emphasized. Tests made three years ago in the New Haven Hospital have shown that in tuberculosis quinine acts very inefficiently as an antipyretic, and in the cases experimented upon, produced a 6% increase in the heat production. Various antipyretic drugs were investigated at that time with a view to determining the respective rôles of heat production and elimination in antipyresis. The following summary of hitherto unpublished results may be of interest in this connection. The respective percentage changes in heat production and elimination during the most marked period of antipyresis are shown :—

Drug and Dose in grams.		No. of Cases	Calories produced % Change	Calories eliminated % Change
Acetyl-salicylic Acid	1 G.	4	—3.5	+38.2
Phenacetine	0.2 G.	1	—13.2	+35.6
Lactophenin	1.0 G.	1	+ 6.1	+16.3
Antipyrine	0.5 G.	3	— 1.2	+21.5
Quinine	0.5–1G.	3	+ 6.3	+22.7
Dextrose (Tbc.)	50–100G.	8	— 1.9	+14.9

From the above it is evident that antipyretic drugs reduce the temperature in tuberculosis chiefly by increasing the heat elimination, and there is no reason to doubt that this applies to other fevers.

How Heat Elimination is Increased:—Dextrose was included in the above work not only because we were able to show that it reduces the temperature in tuberculosis but also because its employment illustrates well the mechanism of antipyretic drug action. This was brought out especially in laboratory studies upon colon bacillus fever in dogs. Barbour and Howard[2] found that intravenous dextrose, like the antipyretic drugs, reduces the body temperature of such dogs, failing to do this in normal animals.

Dogs suffering from colon bacillus fever exhibit an abnormally high blood concentration, owing apparently to a loss of fluid to the tissues; (where, according to Woodyatt[3] "free" water becomes "bound" in febrile conditions). As soon as it could be shown that dextrose given intravenously recalls lost fluid to the blood, producing a greater degree of dilution of the blood in fever than in health, the reason for its antipyretic effect in the former condition became clear. Dilution of the blood promotes the elimination of heat by affording a greater volume of blood to fill the peripheral vessels, and by providing more free water for evaporation from the respiratory tract and skin.

These facts led to the hypothesis that antipyretic drugs act by dilution of the blood, which has been substantiated by Dr. Herrmann and the author.[4] We observed that antipyrine, quinine, aspirin and sodium salicylate all dilute the blood in fever dogs co-incidently with their antipyretic effect. In the normal animal on the other hand, in conformity with its known resistance to antipyretic action, these drugs produce no dilution of the blood. A new factor in antipyresis has thus been demonstrated; augmenting the shifting of blood from the interior of the peripheral vessels we have the shifting of water from the tissues to the blood. Attempts to throw further light upon this mechanism are now being made in the laboratory of pharmacology at McGill.

Modern Antipyretic Agents.—The value of intravenously given dextrose in pneumonia, typhoid and other infections has been pointed out by Litchfield[5] and others. By mouth fifty or one hundred grams are required before sufficient is absorbed to produce antipyresis. This is effective, however, in mild tuberculous conditions.

Among the coal-tar products it is an old story that antifebrine (acetanilide) and phenazone (antipyrine) exhibit a greater collapse-producing tendency than do phenacetin and the salicyl derivatives. Amongst the latter aspirin appears to be the surest antipyretic, but its irritating properties appear to be underrated. In dogs aspirin given in large amounts produces gastric ulceration. It should be taken only with abundance of water. This is to be remembered especially in acute rheumatic fever where large doses are requisite. The tendency to gastric and duodenal ulcers has been associated by some writers with the occurrence of acute rheumatic fever. Is it possible that this is due to medication with concentrated salicylate?

The cinchophen (atophan) group of drugs has recently been found to possess a high degree of antipyretic and anti-rheumatic efficiency. Of these tolysin (ethyl ester of paramethyl atophan) is made upon the salol principle, so that the acid radical is not liberated in the stomach. Furthermore it possesses little or no toxicity, because it is but slowly absorbed from the intestine. Dr. Lozinsky[6] and the author were unable to kill dogs with doses of tolysin up to five per cent. of their own body weight, although we could prove the complete absorption of therapeutic doses both by their absence from the intestinal tract and their marked, although slow, antipyretic action. Acute rheumatic fever cases have been successfully treated by this drug at both the Montreal General and Royal Victoria Hospitals.[7]

The development of a wide field of usefulness for the derivatives of atophan as antipyretics was never dreamed of when this drug was introduced as a uric acid eliminant.

The analgesic action of antipyretic drugs affords a most interesting study which does not fall within the scope of the present article.

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Action of Stronger Solutions of Mercurochrome in Early Gonorrheal Infections.—Ernest Rupel, Indianapolis, has used a five per cent. mercurochrome-220 soluble solution with good results. A disappearance of purulent discharge was effected by the third day in seventy-five per cent. of these cases. In ten, or 21.7 per cent. of the cases, posterior symptoms developed, the severity of which did not differ from the usual incidences of such. Approximately seventy per cent. of the patients reached an apparent cure in one week, and in ten days seventy-five per cent. were cured. Freedom from symptoms, both objective and subjective, constituted a "cure." Fully one-half of the patients have been dismissed more than a year. There have been no recurrences.—*Jour. Am. Med. Assoc.*, February 24th, 1923.

Regeneration of Blood in Infancy.—Opitz, (Monatsschrift für Kinderheilkunde, Leipzig), tried comparatively large infusions of blood in different anaemic conditions in infants. The amounts to be infused were computed to bring the number of corpuscles in the child to normal. They were repeated after from four to ten days, as often as necessary. The results were very good except in two children with lymphosarcoma and myeloid chloroma. He believes that the injected corpuscles are not destroyed, because the signs of regeneration (erythroblasts, basophilic stippling, etc.) disappear from the blood. It is probable that the injected blood takes up part of the work, and gives the bone marrow time to rest and recover. Mixed diet and a moderate reduction of milk may hasten the recovery of the patients.—*Jour. Am. Med. Assoc.*

DIRECT MEASUREMENT OF VENOUS PRESSURE IN MAN

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THE method used for gathering material for this paper has not been used for venous pressure previously. Venous pressure is referred to so infrequently in medical literature that it is not out of place to mention the methods that have been described heretofore. Indirect readings have been reported by Sewall, Hooker, Eyster, Clark, and Brown; direct readings by Moritz and von Tabora in 1910, and by Villaret, Saint Girons, and Grelety-Bosviel in 1921.

The indirect method is carried out by measuring the amount of force that is required to cause one of the visible peripheral veins of the skin to collapse. Some form of capsule is applied over the vein, either by sealing it to the skin or covering its mouth with rubber and holding it in contact with the skin while sufficient air is forced into the capsule to close off the vein. The pressure is gauged by a water manometer connected with the capsule, the point at which the blood stream is controlled being judged by the flattening of the vein or by stripping the vessel to the nearest valve and watching for the re-filling upon reduction of the pressure.

The usual direct method is to insert a hollow needle in a vein and measure the pressure with the manometer connected up with the needle.

The procedure which we adopted was to connect a piece of ordinary glass tubing, 8 or 10 inches long, to a number 18 or 19 gauge needle and measure with a wooden rule the height to which the blood rose in the tube when held vertically.* As needles, especially of the smaller size, did not always work well, a second reading was made in cases of doubt. The patient was tested lying down with the flexor surface of the elbow propped up to the level of the heart. This latter level was considered to be 8 cm. deep from the sternum. The needle and tube were of course carefully sterilized, and before use, were lubricated by drawing a few drops of sterile paraffin into them.

This procedure is apparently reliable, it does not depend upon the visibility of the veins, and requires so little apparatus that it is practicable for any physician.

Of about seventy-five observations on fifty patients, fifty readings have been used as the basis of this paper, some of the results of earlier technique not being uniform. The patients were under care for various complaints but an effort was made to select cases that were likely to show some interference with their circulatory equilibrium .

It was found that the normal pressure ranged from 10 cm. to 14 cm. of blood, which is approximately equal to 10½ cm. of water or 7 to 10 mm. of mercury. Various cases show the following ranges:

(1) 0-6 cm. blood: case of dilated colon with six weeks' persistent debility after removal of cæcum and half the colon.

(2) 7-9 cm. blood: cases of two convalescent fibrillators; one convalescent rheumatic with severe mitral and aortic insufficiency; and one of hypertension with hemiplegia; one asthmatic during an attack.

(3) 10-14 cm. blood (normal): cases of valvular disease, severe and mild, or fibrillators who have been under medical care for long periods; of hypertension and arteriosclerosis (two of these with old hemiplegia); of nephritis; hyperthyroidism; septic broncho-pneumonia; pernicious anaemia and post-operative cases.

(4) 15 to 17 cm. blood: two asthmatics between attacks; one convalescent broncho-pneumonic; two youths with severe mitral and aortic defects who were over-active, contrary to advice; one myocardial case (arborization block), that died three days later, and the above mentioned colon case before operation.

(5) 18 to 20 cm. blood: two very recently

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*It is of interest to note here that the first reading of arterial pressure was made by Rev. Stephen Hale in 1744 by a similar method. He found that the blood from the femoral artery of a mare rose 8 ft. 3 in.

improved cases of heart failure; one acute pneumatic with Pott's spine; one chronic bronchitic with much fibrosis but little prostration; and one asthmatic immediately after partial relief by adrenalin.

(6) 20 to 27 cm. blood: one uncompensating heart case during a period of distress.

All of these readings were taken during the morning visiting hours in the Winnipeg General Hospital.

The factors concerned in maintaining the pressure in the veins may be stated as (1) resistance at the heart; (2) contraction of the veins; (3) the viscosity of the blood; (4) the pressure of the tissues; (5) gravity; (6) pressure from behind (capillaries). These factors are not discussed here. It is merely attempted to classify a number of disease conditions according to their venous pressures as found by the method described and to compare the results with those of other writers as follows:—

	Indirect		Direct	
	Brown	Clark	French Authors	Young
Normal	3–9 (under 10)	8–10	12–13	10–14
Uncompensated Hearts	20–30 (serious myocardial changes)	21–29.7	19–40	18–27
Compensated Hearts	12–18 (moderate compensation)	13–19	normal	normal or less
Aortic Insufficiency	18–1 (well compensated)	.. ..	19–24	normal
Arteriosclerosis	.. ..	.. ..	9–16	normal
Hypertension	normal	.. ..	19–31	normal
Asthma	.. ..	.. ..	..–..	15–17
Some Lung Inflammations	.. ..	.. ..	..–..	18–20

Clark found a wide diurnal variation, amounting to 10 cm. on the average, with a maximum in cardiac cases occurring about midnight, while in normal cases the maximum came about 6 p.m. and the minimum at various times during the day (4 a.m. to 10 p.m.). Other conclusions that he reached were to the effect that pressures above 20 called for vigorous treatment and that if such cases did not respond to digitalis the outlook was grave; also, that pressures which remained persistently below 20 were not easily affected by digitalis, the heart evidently meeting requirements as well as possible. Patients who died all gave a high reading before death—up to 38 cm.

The French authors above mentioned claim that the venous pressure, under physiological conditions, follows the arterial, 1 cm. of venous pressure by water manometer corresponding to 10 mm. of arterial pressure by mercury. This does not seem to be borne out, but we have not fully tested the point. Certainly the increases in the two pressures do not correspond in the uncompensated cases of this series as they describe. An interesting fact in their experience is that two patients with pressures of 25 cm. had a fall in pressure to 10 cm. and 18 cm. respectively, with amelioration of symptoms after they had been treated by bleeding, purgation, and digitalis.

In our series the high figures for some pulmonary cases attracted our attention. One chronic bronchitic and one acute pneumonic had venous pressures of 18 cm., three asthmatics had venous pressures ranging from 16 cm. to 18 cm., and a recent convalescent from broncho-pneumonia had a venous pressure of 17 cm. The heart case which showed a venous pressure of 27 cm. at one examination, showed 17 cm. a few days later when symptoms were less urgent.

It was found also that in a normal young man the venous pressure at the elbow, in the sitting posture, was 10 cm., and at the calf of the leg in the standing position, it was 14 cm.

In an arteriosclerotic with bad varicose veins of the leg, the elbow showed 14 cm. in the prone position, while one of the varicose veins showed 34 cm. in the standing position.

A patient with peritonitis from perforated duodenal ulcer, four days after operation, and another patient, one day after herniotomy, had venous pressures of 11½ and 10½ respectively.

By exerting a pressure of about ten pounds on the abdomen of the patient with acute pneumonia, the indicator promptly registered a rise of 2 cm. which was reduced as the weight was removed; yet very little oscillation of the blood in the tube was ever detected during respiration.

The figures obtained for this report are all from patients in the wards of the Winnipeg General Hospital under fairly uniform conditions. The series of different observers must necessarily show discrepancies according to the stage and type of cases examined. The numbers are far too small to allow of very positive conclusions, but there is enough uniformity in the various papers to satisfy us that there is a field for the application of the test. The technique will have to be standardized and the normal range with its variations will have to be more accurately established, but these features need not interfere with the employment of the procedure; they will be settled naturally in the course of the search for abnormal pressures.

The circulation must be considered as a whole when we are dealing with its relation to disease and yet clinically we have given almost the whole of our attention to the details of the movement of the blood between the tricuspid valve and the capillaries. The physiologists have dug out many facts about the capillary and venous circulation, but the clinician has not yet applied much of that information. On the other hand we have probably tended to overestimate the importance of our clinical findings on arterial pressure.

It may be concluded: (a) that high venous pressure in cardiac cases is evidence of heart failure; (b) that under treatment the pressure returns to normal if the patient shows fair response; (c) that pulmonary cases accompanied by dyspnoea probably have a high venous pressure; (d) that other debilitating conditions such as pernicious anæmia, operations, and hyperthyroidism, do not appear to influence venous pressure.

The cases of nephritis examined had normal readings but they were not of a character to permit of general conclusions being drawn.

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Blood Pressure During Sleep.—Katsch and Pansdorf, Munch. Med. Wochen Schrift, Dec. 15, 1922, were able to study the blood pressure of patients during sleep. The main point was to lead the rubber tubes into another room to increase the pressure of the band slowly and read the pressure quickly. The systolic pressure is normally lower, but the diastolic does not change, except for a slight increase during very deep sleep. Thus the amplitude of the pulse is decreased from both ends. Some patients with hypertension presented marked decrease in blood pressure, and "sleeping cures" might be advisable for them. Other hypertonics (two cases of uremia) had no decrease in the pressure.—*Jour. Am. Med. Assoc.*

Pneumoperitoneum as an Aid in the Diagnosis of Subdiaphragmatic Conditions.—Attention is called by L. R. Sante, St. Louis, to the use of pneumoperitoneum in the examination of acute infectious involvement of the subphrenic space. Very little air is necessary in the examination of this region, and, if inflation is carried on with the patient in a recumbent position under the fluoroscope, any involvement of this space can be at once detected, and the inflation discontinued. If the procedure is carried out in this fashion, there need be little fear of breaking any existing adhesion walling off an infectious process, no matter how delicate or recently formed. Information gained in this manner, either establishing the presence of a subdiaphragmatic abscess or excluding its possibility, is of the utmost value in the prognosis and treatment of the condition. This is especially true since the accepted method of surgical procedure for drainage of such abscesses is very extensive and necessarily involves vital structures. A case in point is reported.—*Jour. Am. Med. Assoc.*, February 17th, 1923.

MALNUTRITION*

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MALNUTRITION may be defined as a condition existing when the body weight is above or below the normal standard for the individual, based on the height of that individual. Dr. Wm. R. P. Emerson states that "After long experimentation, we have found that the best single rule of selection for malnutrition is based upon the relation existing between weight and height and that a body weight habitually 7% or more under the average weight for the child's height is not equal to maintaining him in normal health." Malnutrition is certainly a fundamental handicap and is now recognized as one of the chief causes of defective manhood. As one writer points out, "It affects height and weight. interferes with general development, lowers vitality, making every child susceptible to infections with less chance of recovery and more of relapse. It is likely to precede tuberculosis and it retards mental development." Malnutrition is found among the children of all nationalities and of all classes of society and it is a well known fact that it is prevalent among the children of the rich rather than among those of humbler circumstances. The family of the Italian immigrant shows less malnutrition as a rule than that of any other nationality. It is common in all ages and in both sexes. It has been found that, on an average, 33% of all school children are under weight for their height. This percentage varies greatly in different schools and in different localities. Emerson has shown that in a Chicago school situated in the suburbs where all the pupils came from families in very comfortable circumstances, 57% were found to be undernourished, whereas in a school in the vicinity of the stock yards where the children were from the poorer class families of all nationalities, the percentage was only 18. This fact has been demonstrated in every city and town where malnutrition classes are being conducted. The causes of malnutrition are five: (1) Physical defects; (2) Over-fatigue; (3) Lack of home control; (4) Faulty food habits, and (5) Faulty health habits. Of the *physical defects*, the most common one is nasopharyngeal obstruction. This condition accounts for a large proportion of all undernourished children. In some groups it is as high as 80%. *Over-fatigue* is more common at the present time than ever before. The modern child must not only do well in school, but also carries the additional burden of music and dancing lessons and frequently, attendance at social functions resulting in loss of sleep, is demanded. It is surprising how little time some children have for rest and recreation. *Lack of home control* is also an important factor. Too many homes in these days are ruled by the child. There is no fixed bed-time hour and the child goes to bed when he sees fit. In the morning he is allowed to sleep until an hour that just gives him sufficient time to dress, eat an insufficient and hurried breakfast and get to school. If he doesn't care to have the window opened at night it remains closed. In fact every desire of the child is gratified even at the sacrifice of his own health. *Faulty food habits.* The child will not drink milk and is a tea or coffee addict. The morning cereal is refused and candy is eaten at all hours with the result that there is no appetite for proper food at regular hours. *Faulty health habits.* Lack of care of the teeth, constipation, infrequent bathing, sleeping with closed windows and working in crowded, ill ventilated rooms, are the most common.

These children present a typical clinical picture. They appear dull and listless with a serious or anxious expression of countenance. The muscles are flabby and the resulting posture is quite noticeable, especially if the child is sitting. The skin is pale and there are dark circles under the eyes. If the cause of the condition is nasopharyngeal obstruction, the mouth is open and the expression dull and sleepy. The teeth are usually prominent and the nasal orifice small and pinched. The child is indisposed to physical or mental exertion and is usually backward in school, from one to two years behind the normal pupil of the same age. The scales establish the diagnosis beyond any doubt and show the degree of malnutrition existing. A complete physical examination is made on every child found to be 7% or more underweight. If any physical defect is found it is corrected if possible before the child is admitted to the class.

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*Paper read before the Halifax Branch of the Medical Society of Nova Scotia at Health Centre No. 1, February 8th, 1922.

The class method as developed by Emerson, is, in our experience the best way to treat these cases. As Emerson points out, this method has the following advantages:—

(1) The class method appeals to the imagination of the child and makes him do for himself what no one else can do for him. It teaches and inspires him to train for health in the same way he trains to be a Boy Scout or an athlete. A large proportion will do exactly as we ask them, open windows, take lunches, rest periods, etc.; (2) Economises time of all concerned; (3) Introduces healthy competition; (4) Pools experience of all families for the benefit of each; (5) Favours study and correction of home difficulties by meeting parents under friendly conditions; (6) Removes obstacles too great for the authority of the parent; for the undeveloped reason of the child will yield in a surprising manner to interest developed in class; (7) Removes prejudices and fears through knowledge of results obtained, and convinces in a moment when hours spent in argument have failed; (8) Utilizes the approval of companions as a strong influence in causing a child to do as directed. This last applies to the mother as well as the child. The mother will not willingly permit her child to sit at the foot of the class week after week; pride in her child will cause her to make every effort to advance that child towards the head of the class.

The class is conducted along kindergarten lines and everything is done to obtain the co-operation of the child. A large chart is made for each child and the weight is recorded each week. This chart is placed on the wall in front of the child that he may see some graphic evidence of the progress he is making. The child who makes the greatest gain sits at the head of the class and receives a gold star on the chart. Different colored stars are also given to those who do not fail to take the mid-morning and afternoon lunch and to those who take their rest periods regularly.

As over-fatigue is a great cause of malnutrition we insist that a half-hour period in the morning and afternoon be devoted to complete relaxation on a bed in a quiet or darkened room. The mid-morning lunch taken to school consists of some simple article of diet such as bread and butter or a sandwich; something of a food value of about 300 calories. We find that this lunch does not in any way lessen the appetite for the following meal. Tea and coffee, and candy between meals are absolutely forbidden. We advise the consumption of a quart of milk a day and insist upon a pint. The total number of calories per day should be approximately 3000.

General instruction in hygienic living is given, such as the importance of fresh air by night and day, exercise in the open, required amount of sleep and cleanliness of person and surroundings. Four chief causes of failure to gain have been noticed:—(1) *Illness*: Tonsillitis or "cold" may cause the loss of two pounds in one week. (2) *Environment*: it has been repeatedly shown that a child living in an unhappy home with quarrelsome, nagging parents may fail to gain. (3) *School examinations* may cause the loss of three-quarters of a pound in one week. A child who is active before breakfast may lose one-half a pound a week. (4) *Worry*: In the Emerson clinic three children lost one pound a day when a little sister was missing for three days. The treatment of malnutrition and its effects is simple. Once the physical defects are corrected and the intelligent co-operation of child and parent is obtained, the resulting improvement is striking. There is no additional cost and no trouble. The proper hygienic routine that is established in the home makes for increased happiness in the whole family and gives more leisure time to the parents.

MODERN EPIDEMIOLOGY

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DURING the last twenty-five years comparatively little change has occurred in the methods of treatment of surgical and medical diseases, as compared with the recent advances which have been made in the bacteriological and epidemiological study of the causes and prevention of communicable disease.

The bacteriologist, the epidemiologist, and the vital statistician, have reached a common basis of agreement, which clearly indicates the desirability of putting aside many traditional fallacies regarding communicable disease which are still firmly fixed in the minds of the laity and to which some members of the medical profession engaged in general practice, still yield a tacit obedience. It is with a view, therefore, of encouraging the medical profession to cooperate with health officials generally in enabling the public to gain saner views of the real sources of infection in communicable disease that I have ventured to prepare a short paper on the practical aspect of modern epidemiology.

In accordance with the principles of what is called the new public health, which relegates to oblivion or to comparative unimportance, many of the supposed factors in the causation of communicable disease, I shall attempt to indicate some of the fallacies and mischievous ideas naturally held by even the intelligent laity, as a result of the illogical teachings of our medical profession up to very recent years and which not a few medical men still support, or at least do not oppose.

In speculating as to the cause of an outbreak of communicable disease in a given family, the attention is often concentrated on the environment of the individual affected, the insanitary conditions, real or imaginary, in the neighbourhood, etc., to the exclusion of the real cause of infection in some of the human beings with whom that individual has recently been in contact. In other words, the source of disease is sought for in inanimate things rather than in man himself. In accordance with this environmental theory of disease, it is not so long since malaria was believed to be due to exhalations from swamps and sloughs; typhoid fever or diphtheria to sewer gas, odours from stagnant water, damp cellars, leaky plumbing, decaying vegetation and garbage or dead animals; in general, everything of a disagreeable or non-æsthetic nature was supposed to give origin by a process of biogenesis to all the various germs of communicable disease quite independent of the human being, who directly or indirectly is responsible in practically all cases.

The new views of contagion find the real source of disease in an infected individual and in the emanations from his body which find their way by various and devious routes to the healthy or uninfected individual. Examples of agencies are water, milk, food, flies, and fingers, all of which may be a vehicle by which disease germs find their way into the systems of the uninfected. While health authorities should not fail to give considerable attention to the removal of nuisances, proper disposition of garbage and manure, etc., and everything that is an offence to the æsthetic aspirations of the intelligent citizen, they must concentrate their energies chiefly on the real sources of communicable disease, if they would prevent to as great an extent as possible the spread of an epidemic. To this end there should therefore be investigated:

1.—The infected individual and the probable source from which his infection was derived; 2.—The routes of spread from that infected individual; 3.—The routes of spread from ordinary uninfected individuals to their associates.

With the infected individual precautions preventing him from infecting others should be taken by isolation, effective quarantine, and the destruction or disinfection of all secretions and discharges. To limit the spread of infection from the individual, the necessary attendants or nurse should be fully instructed in ways and means of preventing infective material from reaching the food or oral passages of others in the same house or in a hospital to which the patient may have been removed, and finally the question of the possibility of infection being carried by some person, not suffering from the disease should be given attention. The importance of fomites as a source of disease conveyance has probably been greatly exaggerated in the past. It is certain that disease germs do not long retain sufficient vitality to be dangerous, when separated from the human body and particularly if exposed to bright light and fresh air. It must be admitted, however, that secretions and excretions if transferred on articles of clothing, etc. while still moist and fresh are capable of transmitting infection. The word "carrier" as now used has a meaning limited to the individual who harbours the germs of a disease in his tissues without suffering from the disease itself, and who is capable of infecting others. We have positive evidence that there are "carriers" of diphtheria and typhoid fever. In the case of the latter, a woman called "Typhoid Mary," who being a cook, infected 26 persons in 6 families, where she was employed in this capacity, is the classical example frequently referred to in this connection. Becoming suspected she was eventually found to be a "carrier" of so persistent a nature that she had to be kept in an institution, and though on one occasion she attempted to regain her freedom from restraint, the courts quite properly refused to allow her to resume her old occupation of cooking. While we do not yet know what the germ of scarlet fever is bacteriologically, there is no logical reason why there should not also be carriers of this disease, which may account for some of the cases where we do not appear to be able to locate any definite source of infection.

Up till recent years, the desquamation or peeling of the skin following scarlet fever was believed to be closely associated with the infectiveness of the individual patient and most of the teaching on the subject conveyed this impression which is still firmly fixed in the minds of the laity. Observation and some experimental work appear to have largely discounted this theory. In a recent article on "return cases of scarlet fever," Dr. H. B. Cushing of Montreal, speaks as follows: "For generations the desquamation was supposed to carry the infection, but all the best modern authorities agree that this is a fallacy and that the cast-off scales are not infectious. Most writers believe that the infection is carried by various persistent pathological discharges, and it has been suggested that patients leaving a hospital ward, easily contract catarrhal colds which provide infectious discharges. The most probable explanation is that many scarlet fever patients remain 'carriers' of the unknown causative organism for many weeks or even months."

Air-borne infection largely a fallacy.—That the air is one of the chief vehicles in the conveyance of communicable disease was the universal belief a generation ago even among medical men, and the texts books on hygiene used at that time religiously taught that doctrine. Perhaps the most difficult problem public health officials have to confront, is to dislodge from the minds of the public at large, this firmly fixed but mistaken belief. That air infection was considered of relatively greater importance in surgery than contact infection in the eighties, is indicated by the preparations for an operation in vogue at that time at Bellevue Hospital. Dr. Chapin, of Providence, who has given many years to a study of this subject, relates how a carbolic spray was used in the operating room for several hours before the operation, to disinfect the atmosphere. He relates how, during an operation, the surgeon dropped his knife on the floor, picked it up, wiped it on his gown, and proceeded with the operation, and that the incident attracted little notice and caused no comment. We know now that air infection of wounds is a negligible quantity. Ochsner says: "Air infection is not impossible, but practically no wound infection is to be considered except from contact." And yet it has been clearly demonstrated that the air of operating rooms does contain pus organisms. The explanation of their non-virulence is probably due to their greatly diminished vitality, due to drying and exposure to light. and to their small number. In any case, they fail to infect the freshly cut tissues of an open wound. This being the case, is it reasonable to believe that the ordinary pathogenic organisms float in the air in such numbers and possessed of sufficient vitality to penetrate the intact mucous surfaces of the respiratory or alimentary tract?

Since the mosquito has been found to be the factor in the case of malaria and yellow fever, previously believed to be air-borne diseases, researches have reduced the list of possible air-borne diseases to a comparatively small number, and in these, too, the air as a medium of infection is relatively speaking, now known to be unimportant. That measles, smallpox and tuberculosis may be at times air-borne, is still an open question, but many of the leading authorities who have studied these diseases, maintain that air infection is relatively so rare and unimportant as to be negligible. In my experience in Edmonton with over four hundred cases of smallpox, I have been able to satisfy myself that personal contact with a previous case was present in the great majority of the cases, and in no case have I been able to prove in cases in which fomites or air infection might appear to have been a possible source, that contact could be absolutely excluded as a factor. In an article on air as a vehicle of infection, in the February number of the *Journal of the American Medical Association*, Dr. Chapin, Superintendent of Health of Providence, deals fully with the subject, and sums up as follows: "There is little evidence that among the diseases which commonly occupy our attention in this part of the world, aerial transmission is a factor of importance. In most, it is under ordinary conditions of home and hospital, a negligible factor. For tuberculosis alone, is there evidence that air-borne infection is a factor of moment, but the latest word has not been said as to the etiology of this disease. We may be sure that the sewer gas bogey is laid, the notion that dust is a dangerous vehicle of every day infection is unsupported, and that mouth spray is usually effective only at short distances."

How genuine is the fear of danger from air-borne infection in the public mind is strikingly indicated by the clamour of protest which assails a city administration when it proposes to build a municipal hospital for contagious disease in any section where a large residential population has become established in advance. In Toronto the Good, and supposedly the intelligent, an admirable site for such an institution selected by the Medical Officer of Health, had to be abandoned some years ago on account of strong public protest, and later, when a site outside the city limits remote from population was suggested, the farmers of York County registered an objection. And that this theory of an air-borne infection still influences many members of our profession, and even some of our public health officials, is indicated in the tendency to build hospitals for contagious diseases on the pavilion principle, with all their attendant inconveniences and high expense of operation, rather than on the block system, in spite of the fact that infectious diseases are treated with the best results and maximum freedom from cross-infection in many hospitals recently erected, where the only precautions taken are to guard against contact infection, and air-borne infection is absolutely disregarded. Examples of such hospitals are the Pasteur Institute, Paris; the Kingston Avenue Hospital, Brooklyn; the North Brothers' Island Hospital; the Children's Hospital in Paris, and the contagious group of the Providence City Hospital. Winnipeg several years ago opened its new block hospital, conducted on the same principle, and with efficient nursing has had equally good results. Edmonton is about to build a new isolation hospital of the block type. A well trained and strictly disciplined staff of nurses is of course essential to success, but no other quality of nurses should be tolerated in any type of hospital if cross infection is to be reduced to a minimum. Roseneau, in his recent excellent work on Preventive Medicine and Hygiene, states that communicable diseases are not conveyed from ward to ward or even from bed to bed, in well managed hospitals.

Contact Infection Chief Source of Communicable Disease.—Before concluding I desire to emphasize the fact that, with the exception of water-borne epidemics of typhoid fever, or milk-borne infection in typhoid fever, scarlet fever, and diphtheria, which are now fortunately of rare occurrence due to advanced knowledge and the more rigid enforcement of public health measures of prevention, the great factor in the causation of communicable disease is contact infection. This implies the close association of the well with the affected and the transference to the former of the infective contagium contained in the secretions or excretions, while still moist and fresh, on fingers, food, spoons, toys, etc., which have recently been mouthed or handled by the affected individual or in contact with his person or his discharges. This theory of contact infection is now accepted by practically all the leading sanitarians; it maintains that persons, not things, are chiefly responsible for transference of infectious disease and that infectious diseases are not to any appreciable extent carried by the air As a natural result of the air-borne theory of disease, there has been inculcated in the minds of the public, an entirely exaggerated idea of the value and importance of fumigation as a means of disinfection after infectious disease. The Provincial regulations of the Health Act call for the use of formaldehyde fumigation even in cases of measles and mumps. During the year 1921 we had 2381 cases of mumps and 417 cases of measles. Had we carried out fumigation as directed by the Health Act, we would have expended a very large amount of money and so far as experience throughout the world is concerned, as expressed by the most prominent sanitarians, we would not have had the slightest results in the control of the epidemic. In these cases a disinfectant bath for the patient on recovery was ordered, and a general cleaning and airing of rooms and boiling of all washable bedding and articles of clothing. In this connection the following statement in the *American Journal of Public Health* for February, 1915, emanating from the New York Health Department is significant.

"The New York City Health Department has given up fumigation after cases of infectious disease, as a costly procedure, the inutility of which has been well established. In reply to the query of a New York State physician, as to the 'why' of the action, Commissioner S. S. Goldwater stated that the Department was willing to profit by the lessons of experience and prepared to go forward even at the risk of being misunderstood for a time by the laity and by those members of the medical profession who are content to practice according to formulas which were valid a generation ago but which should now be supplanted by more enlightened views." He said that it was "disconcerting to read that health officers lack the courage to discontinue practices which they publicly confess as valueless," and asked whether it was not the duty of the department to the tax-payers to discontinue the practice. In Ottawa for 1921, where there was a very severe smallpox epidemic during the year, formaldehyde disinfection was entirely discontinued and very satisfactory results are said to have been secured by substituting for it disinfection by the spray system using liquid Izal in strength of 1 to 200. The expenditure was $250, as compared with $1,183. in 1920 under the old system of using gaseous disinfectants. Dr. Haven Emerson, Professor of Public Health, Columbia University in discussing the subject of "Epidemiology" in its relation to "Methods of Control of Communicable Disease" in the February issue of the *American Journal of Public Health*, speaks of the abandonment of gaseous fumigation recently as follows: "The abandonment of gaseous fumigation at the termination of those infections spread commonly through discharges from the respiratory and intestinal tracts and the substitution therefor of medical asepsis and the technique of concurrent disinfection in the sick-room, have been perhaps the most important of the many changes in procedure brought about by analysis of a long series of epidemiological studies. mainly bacteriological in character."

Investigations of Canned Meats.—A report on the bacteriology of canned meat and fish prepared by the food investigation board of Great Britain, recently issued, represents the first comprehensive study which has been made in that country of the bacteriology of canned food products. The board made a detailed examination of 323 cans of food, 246 of which were rejected. The most striking fact in the report is the non-sterility of cans which were externally sound. Less than 30 per cent. of these cans when examined were sterile; the percentage not sterile ranged from 36 for sardines to 100 for crab. Of canned meat, 63.6 per cent. of the cans were not sterile. This report, the London Lancet states, gives the death blow to the generally accepted conclusion that canned foods remain good because the processes of preservation by heat have sterilized them.—*Jour. Am. Med. Assoc.*, April 14, 1923.

METHYLENE CHLORIDE IN ANAESTHESIA

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DURING the last two years interest has been revived in the use of methylene chloride (CH_2Cl_2) as an anæsthetic. For a time after its introduction into surgery in 1867 by Richardson, this substance enjoyed considerable favour in some quarters, but eventually it fell into disuse. Considerable confusion characterizes the early reports concerning methylene chloride because the material supplied in the trade evidently was not what it purported to be; one preparation at least was demonstrated to be nothing more than a mixture of chloroform and methyl alcohol. Consequently some of the statements concerning methylene chloride were in reality based upon the use of chloroform.

In 1884, Regnauld and Villejean[1] described experiments on dogs in which a pure preparation of methylene chloride compared with the action of chloroform. Their description of the action of the former is worth quoting:

"*After one-half minute of inhalation*—Commencing agitation; some barking; *One and a half minutes*—Dilation of pupil; beginning corneal insensibility, nystagmus; *Two minutes*—Abolition of corneal and palpebral reflexes; general insensibility; persistent nystagmus; *Three minutes*—Clonic movements; simulating running or better swimming; all four legs and tail participate; *Four minutes*—The same phenomena continue; inhalation discontinued. Animal loosed and left to itself. In spite of the insensibility the clonic movements in the muscles of legs, face, prepharyngeal region and diaphragm continue; *Six minutes*—Returning consciousness. Corneal reflex reappears. Contracture of the jaws persists; anæsthesia not over; *Seven minutes*—Epileptiform or choreiform attack; *Nine minutes*—Contracture of jaws and neck persists; *Eleven minutes*—Symptoms diminish. Animal tries to stand but its paws support it much as in the case of strychnine poisoning; *Twenty minutes*—Contracture of muscles of the neck; *Twenty-two minutes*—Animal cannot open mouth; strabismus; *Twenty-two to Thirty minutes*—Return to normal state. However, the dog whose jaws can now be opened, keeps its head lowered, does not answer the call of its keeper and seems under the influence of a kind of hallucination.

We have repeated this experiment with the exception that a cone was employed instead of a Junker inhaler, and can confirm the above statements in all essentials. The methylene chloride was administered for 20 minutes and at no time was there a degree of quietness or relaxation which would indicate its value as an anæsthetic.

In another experiment the animal was placed in a glass case into which air carrying methylene chloride vapour was blown (the apparatus was that usually employed in this laboratory for inducing ether anæsthesia in dogs). By employing a considerably higher concentration of methylene chloride than is necessary in the case of ether, a condition approaching ether anæsthesia was produced after about 15 minutes. The induction was marked by extremely violent muscular activity and the abundant secretion of saliva. The animal was then removed from the case and prepared for the measurement of blood pressure, the mixture of air and anæsthetic vapour being administered intrapharyngeally. For a short time the fairly complete anæsthesia continued, but thereafter restlessness and violent movements superseded to such an extent that the advisability of employing methylene chloride alone as a surgical anæsthetic was certainly not encouraged, though throughout the motor excitement obtaining the animal was insensible to pain. The blood pressure remained high for about twenty minutes, after which the concentration of the anæsthetic was increased to the limit and a typical chloroform death ensued.

Hellwig[2] has recently employed methylene chloride for narcosis in man. He found it "entirely unsuited for complete narcosis."

Following the stage of analgesia in which there was loss of consciousness and susceptibility to pain, a period of excitement developed such as is rarely seen after either ether or chloroform, and conforming well with the condition in dogs described by Regnauld and Villejean. In the attempt to overcome the excitement stage, an alarming condition developed. To be sure, the muscle tone relaxed completely, but simultaneously breathing became laboured, deep and extraordinary salivation began. There was deep cyanosis, sweating, maximal pupillary dilatation, and a rapid weak pulse. To avoid a calamity the narcotic was discontinued: respiration was stimulated mechanically and oxygen was given. Recovery was complete and the operation continued under ether. Hellwig then employed the substance for the induction of narcosis and as a substitute for ethyl chloride in which cases it was satisfactory. Recovery is not so rapid as in the case of ethyl chloride which may be of advantage in switching over to ether or chloroform. Methylene chloride appeared to be of especial value in connection with operations performed under local anæsthesia to obviate the undesirable effects of the operative procedure on the mental anxiety of the patient. It was found possible to maintain a condition of analgesia for hours without any subsequent ill effects on heart, kidneys, liver or lungs.

The animal experiments recorded indicated decided limitations to the use of methylene chloride, but in view of Hellwig's observations it seemed desirable to employ it clinically. Accordingly it has been used on a number of occasions during the past three months at the Montreal Maternity Hospital, and at the Montreal Western Hospital. In human subjects a stage of anæsthesia not seen with other agents was observed, that is, between the so-called first and second stages a period ushered in by analgesia occurs, which is characterized by anæsthesia without loss of muscular power. This stage is followed by one of severe excitement if the administration is continued. The limits of clinical application are therefore restricted to those effects which occur prior to the violent muscular activity. The desired stage can be attained by administering methylene chloride to a point at which consciousness is lost. Administration of the drug is then discontinued, but on the first sign of return of consciousness is renewed, so that by a process of intermittent administrations the pain of many procedures may be alleviated. We can recommend its use for the relief of the pains of labour in which the contractions of the uterus do not seem to be impaired, for the induction of anæsthesia prior to the use of other less agreeable anæsthetic agents, in all outdoor minor surgical procedures, for painful dressings, and particularly in dentistry for the extraction of teeth and the preparation of painful cavities.

References

(1). Regnauld and Villejean. *Comptes rendus de la Société de Biologie*, 1884, p. 159.
(2). Hellwig. *Klinische Wochenschrift*. 1922, p. 216.

Sudden Death in Scarlet Fever.—During a period of nine years (1913-1921), 2,322 patients with scarlet fever were treated at the Durand Hospital, with a total mortality of eighty-five, or 3.7 per cent. In two instances, death occurred suddenly and unexpectedly with only slight premonitory signs, and when each patient appeared to be on the road to convalescence. These two cases are reported in detail by T. F. Krauss, Chicago. The virus or toxins of scarlet fever seem to have an especially deleterious effect on the heart in some cases, as Welch and Shamberg point out. In those reported by Gouget and Deschaux, by Weil and Mouriquand, and also in the author's, direct action on the myocardium is apparent. Broadbent is inclined to believe that it has its action on the heart ganglions. No evidence was found in the author's case to bear out this view Since grave myocardial lesions may not be apparent clinically, and since in many of these cases death has followed some slight physical exertion, it would seem that absolute rest in bed is indicated in all cases of scarlet fever, especially during the acute stages, and more particularly in those in which one may suspect myocardial lesions.—*Jour. Am Med. Assoc.* February 17th, 1923.

Case Reports

POST OPERATIVE RECURRENT APPENDICITIS

R. O'Callaghan, M.D., F.A.C.S.

The occurrence of two cases of recurrent appendicitis following operations within a few weeks is the excuse for writing a paper on a much discussed subject.

Case 1.—Girl, aged five, operated upon one year ago for acute appendicitis with abscess: Operation consisted at that time, as the child was very sick, in simple incision with drainage; ever since she has had a discharging sinus, (no fœcal matter). She was admitted into hospital from the country on account of a persisting sinus, with history of no pain since drainage. After keeping her in bed for three weeks on a low diet, the sinus closed, and the patient was to be discharged with a warning to the parents to notify the hospital at once if any development of pain occurred. Two days previous to going home she again took ill with typical signs of acute appendicitis. Operation was undertaken immediately and an acutely inflamed appendix embedded in adhesions was removed. The wound closed without drain and recovery was normal.

Case 2.—Boy aged seven; two years previously had what was diagnosed as an attack of appendicitis with abscess. He was kept in bed with poultices on the abdomen. The mass disappeared slowly and the child apparently got well. The doctor told the parents that the abscess had ruptured into the bowel. During the last six months he has complained of cramps low down in the abdomen.

Examination.—A fairly well nourished boy, who says he has crampy pains after eating and that it hurts him when his bowels move; no vomiting; abdomen moves freely; no scar; tenderness present over whole of lower abdomen; rectal examination reveals marked tenderness in region of appendix.

Diagnosis.—Appendicitis; operation was advised. Parents were told that although the abscess *had ruptured into bowel*, the appendix was still present.

Operation.—Right rectus incision. Caecum found drawn from middle line and fixed. On tracing appendix from base, the tip was found fused to rectum, if this term may be used. It was very difficult to be sure where to place the clamp owing to fear of entering rectum and about half an inch attached to bowel was left and cauterized. The wound was closed without drain. Recovery was normal.

There can be no doubt that as long as any portion of an appendix remains recurrent attacks must be feared. Sir Frederick Treeves reported in a large series twenty-four per cent. of recurrences following operation for abscess. The same author described further attacks in two cases with mere stumps left following previous attacks. Williams (*B.M.J.*, 1907) reports case of an acute attack in an appendix lying free entirely from caecum following a previous operation.

The question is, should the appendix be sought for and removed in these abscess cases? If the operator is careful and his technique good, the complete operation should be done in the greater number of cases. If the field is carefully walled off with towels before opening an abscess, there should be very little, if any, pus spilt into the general cavity. By making an incision approaching the peritoneum away from the abscess, and then placing a careful walling off, the results are usually very satisfactory, especially if one drain reaching to Douglas' pouch is left for twenty-four hours and another direct into the bed of removed appendix. The wall *should not be closed* too tightly and interrupted sutures should be used throughout.

After-treatment.—No purgatives. Morphia freely for restlessness. Five per cent. glucose in tap water by rectum; patient in Fowler's position, or better still, in case of children, have the head of the bed well raised. A great danger in leaving the appendix is that it is often very difficult to persuade a patient to return for further operation. A recurrence is nearly always fulminating with the presence of adhesions. As long as the diseased organ is left the patient is always in a precarious condition and liable to complications; secondary abscesses; pulmonary complications, and portal pyaemia. Faecal fistula, obstruction, ventral hernia are more apt to ensue due to the necessity of prolonged drainage. Convalescence is prolonged in every case, and as my second case illustrates even a spontaneous rupture into the bowel does not mean a cure.

Conclusions

1.—In a very limited number of cases, when your patient is critically ill with other complications, simple drainage may be the saving of a life.

2.—With proper technique and care in handling the case it is better, in almost every case, to do the complete operation at once.

3.—In those cases in which only simple drainage has been done, the patient must be strongly advised to have the offending organ removed before any further trouble appears.

ANEURISM OF THE ARCH OF THE AORTA ASSOCIATED WITH ANEURISM OF THE COMMON CAROTID ARTERY

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Aneurism of the arch of the aorta is not uncommon and is one of the more frequent complications of syphilis. A. R. Lamb in his article in *Nelson's System of Medicine* states that aortic aneurism as a complication of syphilitic aortitis occurs in from twenty-seven per cent. to thirty-nine per cent. in two series of reported cases. Unfortunately, however, cases of aneurism are so frequently overlooked that the majority of diagnoses are made in the autopsy room and a physician, especially the general practitioner, may go through a life-time of practice without even seeing one case. Alfred Martinel in *La Presse Medicale* (October 16, 1920) reports twenty-nine cases of the aorta collected by him from 4,000 general examinations, which is one in one hundred and sixty cases. He explains that it is possible that this frequency was influenced by the fact that he specialized in diseases of the circulatory system, and he considers aneurism of the aorta a relatively rare affection. It is because of this reason and because of the interesting history connected with it that this case is reported.

A. B.—male, aged 44 years, came to my office complaining of slight dyspnoea and general weakness, and displaying a small pulsating swelling on the right side of the neck. He was a married man and had three children. The eldest was thirteen years of age, and alive and well. The second died at age of six months of unknown cause. The third, a girl of six years was also in good health. His wife had had no miscarriages or abortions. He was a merchant and had never done any hard manual labour. He was moderate in all his habits and did not drink or smoke. He said that he had had previously no serious illness; no rheumatism and no gout. He gave a history of having had a small painless sore on the glans penis about twenty years ago for which he received local treatment, but never had had a rash or secondary symptoms. His family history was negative. The date of the first appearance of the symptoms of the present illness is indefinite. He said that he had had a *cough* on and off for five or six years. He had never had much expectoration; each attack would last from a few days to several weeks, and the cough varied in severity. He attributed this symptom to "his catching cold" and on one or two occasions he visited a physician who confirmed the patient's diagnosis and prescribed him a cough mixture.

About the same time (1917) patient observed that on the right side of his neck there appeared *a small pulsating swelling* to which he paid no attention as there was no pain or discomfort. This pulsating swelling gradually enlarged until it became about the present size, that of a walnut. It is interesting to note that about the year 1918 the patient applied for insurance and was examined. The patient showed the examiner the swelling in his neck and was told that it was due to his frequent colds and was advised to take more exercise. *Dyspnoea* did not appear until the year 1920. The patient then noticed that moderate exercise brought on an attack of shortness of breath. This symptom had been gradually becoming worse of late. When he consulted me he could not walk upstairs without feeling very fatigued, and walking a distance of two blocks would compel him to stop and rest.

General weakness appeared synchronously with the dyspnoea and was becoming progressively worse. *Tachycardia* appeared comparatively late and only within the last six months did the patient complain of feeling his heart "pounding away." There had been a steady loss of weight; twenty pounds within the last three months. During the last six months the patient had felt much *gastric discomfort* described by him as "a heavy feeling," in the region of the epigastrium, particularly after ingestion of food and associated frequently with a feeling of nausea but no vomiting.

Examination. The patient appears to be well nourished and built, but somewhat anaemic and excitable. The skin appears yellowish-green in colour, not unlike that of pernicious anaemia. The scalp is bald. There is no visible rash. The lungs appear to be clear and, with the exception of a slight amount of emphysema, are apparently negative. Teeth, mouth, and throat are in fair condition. The abdominal wall is fairly well padded with fat. There are no masses to be felt and no rigidity. The spleen could not be palpated, but is apparently enlarged. The patient appears to be somewhat "highly strung," for the simple routine examination accelerated the pulse rate considerably. The pupils are equal, regular, react to light and accommodation. Abdominal reflexes are normal; knee-jerk, plantar reflexes, Oppenheim's and Gordon's reflexes are all normal; no ankle-clonus; Romberg's sign negative; no tremors. The *urogenital system* is apparently negative with the exception of two small scars on the glans. The inguinal glands are palpable. The epitrochlear glands could not be felt. There is apparently a slight enlargement of the right lobe of the thyroid gland. The *vascular system* is the system most affected. The patient's pulse since his admission to the hospital has varied from 75 to 120 per minute. Blood pressure, right arm $\frac{182}{87}$, left arm, $\frac{170}{85}$. The pulse rate varies slightly at times when taken at the different wrists, but the variation is very slight. It is of the typical water-hammer type. *The heart* is apparently greatly enlarged. On inspection no pulsation at the precordium could be noticed, but the chest in front, in the neighbourhood of the second and third ribs, appeared to be slightly full. The apex beat is heaving and diffuse and lies in the sixth intercostal space, about five and one-half inches from the midsternal line; the beat is visible in the epigastrium. A small pulsating mass, about the size of a walnut, could now be observed on the right side of the neck; the pulsation being synchronous with that of the apex. The superficial cardiac dulness is enlarged. The dulness extends above the level of the third costal cartilage about two inches to the right of the midsternal line, and laterally to the left about five inches from the middle line (see figure 1). A systolic thrill can be detected on palpation over the left second and third ribs close to the sternum. On *auscultation* murmurs are distinctly heard over both the aortic and mitral areas. The aortic murmurs are both systolic and diastolic in time.

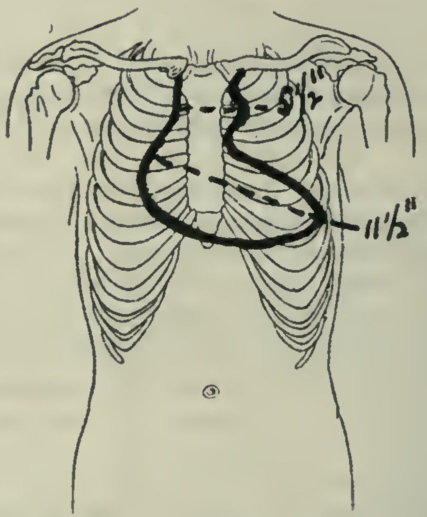

FIG. 1.—This figure represents an outline of the heart, as seen, when viewed under the fluoroscope.

Note the great dilatation to the right of the midsternal line. Also the aneurismal dilatation of the arch of the aorta.

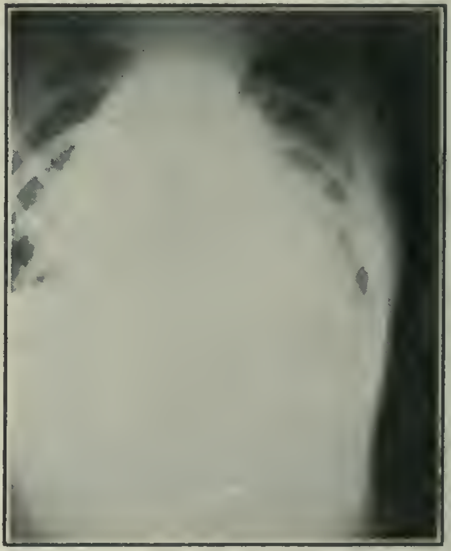

FIG. I.—This figure represents an outline of the heart. with the size of the thoracic cavity. The x-ray was taken by the orthodiographic method (6 feet 6 inch. distance). Note the dilatation to the right.

In the laboratory the following tests were taken: the Wassermann was positive +++. The blood count showed haemoglobin—100 per cent.; R.B.C.'s—5,696,000; colour index, 8; W.B.C.'s, 8,200; polymorphonuclears, 75 per cent.; lymphocyte, 25 per cent.; no poikylocytosis nor anisocytosis was observed. Urinalysis; dark amber acid; Sp.gr., 1,022; no albumen, no sugar; no bile; microscopical examination was negative. The fluoroscopic examination was interesting; the heart was large and occupied practically the entire thoracic cavity. A tracing of the outline of the heart was made on the screen and its measurements are shown in the illustration (figure 1). A plate, which is here reproduced, was then taken (orthodiographic at 6½ feet distance), with the valuable assistance of Dr. Ferguson, of Qu'Appelle. It shows the actual size of the heart and also the enlarged aorta. The measurements of the heart according to the plate are as follows: length, 15+9.7=24.7 cm.; width, 8.3 cm. to right of midline, 13.4 cm. to left of midline; transverse diameter, 21.9 cm.; width at 2nd interspace, 9.5 cm.; bulb of the arch 9.5 cm.

The patient is now at absolute rest in bed, with weekly injections of mercury. Potassium iodide in the form of concentrated solution is also given grs. xl four times daily. The patient is feeling a little easier, but of course it is doubtful whether he will receive permanent improvement.

OTITIS MEDIA SIMULATING TUBERCULOUS MENINGITIS

From the Bulletin of the Harvey Club, London, Ont.

Baby R. 3 months, breast fed, 3 days languid, drowsy, no pain, nursing normally, temperature and pulse normal. No suggestion of blindness. Marked nystagmus, retraction of head, increased knee jerk. Babinski present. Family history, negative for tuberculosis

Fifth day—Temperature 100.6°, cerebral symptoms more marked, lumbar puncture, some slight pressure, relieved symptoms for six hours then projectile vomiting. Eyegrounds negative. Nursing stopped, rectal feeding.

Sixth day—Temperature 107.8°. Twitching, retraction of head and opisthotonus, retracted abdomen—tache cérébrale. One ear drum congested and paracentesis done.

Seventh day—Temperature 102°. Symptoms abating. Artificial feeding, restless and some crying though not hydrocephalic.

Fourteenth day—Slight twitching of eyes, otherwise almost normal. J. I. FERGUSON

GONOCOCCAL ARTHRITIS IN A NEW-BORN MALE INFANT

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Gonococcal infection of the eyes in the new-
plicated by evidences of a blood infection. The
case here reported is of interest for the reason
that the patient developed an acute gonococcal
born is a common disease, but it is seldom com-
arthritis eighteen days after birth.

Report of Case:—

C. E. J., coloured, born December 4th, 1922.

Family History.—The father had gonorrhea just before his marriage. The mother, who had previously been healthy, developed a vaginal discharge during this her first pregnancy. One week post-partum she developed a multiple arthritis which was diagnosed as gonococcal in origin. No history of miscarriages.

Personal History.—A full term child. Labour was prolonged and terminated by high forceps delivery. The infant was healthy at birth. It was reported that the eyes were treated with silver nitrate. The cord separated on the fourth day without signs of infection. On the fifth day there was a muco-purulent discharge from the right eye with slight conjunctivitis. This was treated by boric acid irrigations and cleared up within a week.

Present Illness.—On December 18th, at the age of 14 days, the infant was first seen at the Pediatric Out-patient Department of the Royal Victoria Hospital. The mother had on the same day been admitted to the hospital. Examination of the child was negative. He was seen again on December 20th, and was admitted to the hospital in order to continue breast feeding.

Physical examination on admission showed a normally developed, coloured, male infant weighing 8 lbs. 13 oz. Temperature normal. The skin showed physiological desquamation. No enlargement of the superficial lymph nodes. Head normal in size and shape. The conjunctivæ and corneæ were not inflamed and there was no discharge from the eyes. Ears, nose, and mouth normal. The heart and lungs were normal. The abdomen was normal, the stump of the umbilical cord was clean and dry, the spleen was not palpable. There was no urethral discharge. Joints not swollen or painful. The urine was normal. Smears from the eyes and urethra showed no pus or gonococci.

The infant was put to the breast every three hours. On December 21st, the temperature rose to 101° at 8 a.m. On December 22nd, the infant cried loudly especially on being moved, and on this day the temperature rose to 101.2°. It was noticed that the right wrist and hand were definitely swollen. The overlying skin was hot, tense and slightly cyanotic, and on palpation there was definite tenderness especially in the metacarpal region. No fluctuation present. On the following day the hand was more swollen especially along the tendon sheathes in the metacarpal region. There was also a swelling of the left knee joint with definite fluctuation, especially in the suprapatellar bursa. The skin over the knee was reddened and hot. The temperature was normal. Hot fomentations were applied to the wrist and knee. On December 24th, the knee joint was aspirated in the suprapatellar region by Dr. F. A. C. Scrimger, and several cubic centimeters of frank greenish pus were obtained. A smear of this showed numerous pus cells, but no organisms were found. The pus was cultured. W. B. C.'s 20,000: R. B. C.'s 4,400,000. On December 25th, the bacteriologist reported that a gram-negative deplococcus of the morphology of gonococcus had been grown from the pus. The organism was later proved to be gonococcus by its cultural characteristics. On this date the hand and wrist were somewhat less inflamed and the child's general condition was excellent. On December 26th, a radiogram of the wrist and knee showed no bone lesion. On December 27th, the knee joint was more tense—the fluctuation more marked and the subcutaneous tissue over the joint quite œdematous. There was definite swelling of the tendon sheathes along the inner hamstring muscles. On the following day, December 28th, as the knee showed no signs of improvement and pus was streaking through the puncture wound where the aspiration had been done, it was decided to open the joint. This was done by Dr. Scrimger. Two incisions were made in the suprapatellar bursa on either side of the knee joint. A large amount of thick greenish pus was evacuated. The incisions were left open and movement of the joint encouraged following the principle described by Willems. Smears from the pus showed a very few intra-cellular gram negative biscuit-shaped organisms. The pus was cultured. On December 29th, there was a free discharge of pus from the knee. The general condition of the patient was good, and the swelling of the hand was decreasing. The culture of the pus obtained on the previous day showed the presence of gonococci. January 2nd, the Wassermann reaction on the blood was negative, the gonococcus complement-fixation test was++++.. January 5th, there was free movement of the knee joint. The hand was still slightly tender and swollen. January 18th, the condition of the mother was good although the arthritis was still present. The Wassermann reaction on her blood was negative, the gonococcus complement-fixation test was ++++. January 20th, the discharge from the knee ceased. February 1st, the wound was dry and completely healed. W. B. C.'s 14,000. February 8th, no limitation of movement in the knee joint, but still slight thickening of the tendon sheathes of the hamstrings. Hand showed slight swelling in metacarpal region but no tenderness. Weight of child 10 lbs. 5 oz. Discharged from hospital.

Although bacteriological proof is lacking, it is reasonably certain that the patient suffered from gonococcal ophthalmia which ran a mild course and that this was the source of the generalized infection. Cases similar to mine have been reported on different occasions. Sokolow[1], of Moscow, in 1898 reported a case in which the mother developed gonorrhea during pregnancy. This was complicated by arthritis. A male child was born who developed gonococcal opthalmia, and on the ninth day showed arthritis of the left wrist followed by a similar condition in the left hip. After symptomatic treatment the condition cleared up. Brehmer[2], in 1905, reported a similar case in a male new-born infant. He died. Reinhard[3] in 1914, reported a case occurring in a male child. In this case, however, the mother noticed a urethral discharge shortly after birth. When seen by him on the twelfth day, the urethral discharge had disappeared, but the patient showed a typical left-sided gonorrheal epididymitis. On the following day this formed a discharging sinus through the scrotum and the epidymus on the right side also became involved. On the fifteenth day there was an arthritis of the left knee joint. The infant died on the sixteenth day. He speaks of the rarity of gonococcal urethritis in the new-born.

The common avenue of infection in the newborn is the eyes. Marfan[4] states that less commonly there may be vulvitis, stomatitis and rhinitis of gonococcal origin. Kimball in 1903 reported a series of ten cases of gonococcal arthritis occurring in Holt's clinic in one year. These, however, were not in the new-born and the infection was not contracted at birth. In eight of these no local lesion could be found. He considered the probability of a stomatitis being the starting point of the infection. Most writers writers state that gonococcal arthritis in infancy runs a mild course and clears up without operation. If, however, frank pus is obtained from the joint, as in our case, an incision must be made and the joint drained. The good results obtained in the treatment of septic knee joints by the Willems treatment suggest this as the method of choice.

References

1. Sokolow, *Dietsk. Med. Mosk.* 1898, III, 41. 2. Brehmer, *Deutsche Med. Wchnschr.* 1905, XXXI, 64. 3. Reinhard, *Muenchener Med. Wchnschr.* 1914, CLXXI, 351. 4. Marfan, *Rev. prat. d. trav. de Méd.* 1896, LXII, 299.

Characterization of Various Forms of Endocarditis.—The bacterial and the indeterminate groups of cases of endocarditis are discussed by Emanuel Libman, New York. The indeterminate group consists essentially of two types of cases: (1) an atypical form of verrucous endocarditis, and (2) those cases usually described as terminal. By the atypical variety is meant the form of endocarditis in which the Aschoff body is said to be the characteristic lesion of the disease, the case being of rheumatic origin. Of cases clinically recognized as rheumatic fever and exhibiting at postmortem examination the typical verrucous lesions, only eighteen out of fifty-six exhibited Aschoff bodies. The clinical histories of the other thirty-eight cases made it clear that many of them at least were cases of true rheumatic fever. It is evident, therefore, that not all cases of rheumatic fever are accompanied by the specific lesion. Besides those cases that present the clinical picture of rheumatic fever and the typical verrucae on the valves, but not Aschoff bodies, there exists a group of cases presenting more or less the clinical picture of rheumatic fever (with perhaps a greater tendency to the occurrence of purpura and erythema), not showing Aschoff bodies at the postmortem examination, and accompanied by lesions on the valves which do not correspond to those usually found in rheumatic fever. Bacteria have thus far not been found in the vegetations of this group. It is possible that some of them represent unusual types of vegetation of rheumatic origin. In fatal proved cases of rheumatic fever studied by Libman, the tricuspid valve was involved in twelve of eighteen cases, or more than sixty-six per cent. Of fifty-six cases classed clinically as rheumatic and showing typical vegetations at the postmortem examination, but without Aschoff bodies, thirty-one were accompanied by vegetations on the tricuspid valves. In cases of acute bacterial endocarditis, the right side of the heart (tricuspid or pulmonary valves, or both) was found involved in fifteen out of fifty-six cases, or 26.8 per cent. The mitral valve was affected more often than the aortic, the same holding true of cases of subacute bacterial endocarditis. In cases of the latter disease, the right side of the heart was involved once (tricuspid) in more than 100 hearts, and the lesion was slight. The atypical cases involve the right side of the heart frequently, in one instance the pulmonary valve being affected. This valve was not found affected in any definitely proved case of rheumatic fever. Terminal endocarditis appears to be a disease of the left side of the heart, the mitral valve being the usual seat of the disease. Other clinical phases of endocarditis are considered by Libman, and in closing he says that it is evident that the disease which was considered rare, subacute bacterial endocarditis, is now recognized as one of the common diseases. It was supposed to be a practically uniformly fatal disease. Now more and more often partial or complete recoveries are noted. Very mild cases exist, and there is a recurrent form of the disease. In other words, the interest is shifted toward the question of healing. It will be of the greatest value if an active campaign is undertaken for the purpose of preventing this as well as other forms of endocarditis.—*Jour. Am. Med. Assoc.*, March 24, 1923.

Editorial

THE ANNUAL MEETING

FROM a perusal of the preliminary programme published in our last number, our members we hope will observe that the annual meeting to be held in Montreal, June 12th, 13th and 14th, promises not only to be most interesting but in some features to be unique in the history of the Association. For some years it has been felt that the programme should consist of more than the presentation of papers which could be read in the *Journal* by stay-at-home members; that a definitely clinical aspect should be given to the meeting. Another opinion oft-times expressed has been to the effect that the general meeting should be divided into numerous sections each dealing with a special department and each attracting to its sessions members especially interested in its special branch of medicine. The local committee has endeavoured to meet these views and has at least introduced the thin end of the wedge.

Clinical sessions will occupy two forenoons of the meeting and will also be definitely sectional in character. The general sessions will be held in the large auditorium in the Mount Royal Hotel and the programme for each session has been carefully designed to interest all branches of the profession, with the exception, perhaps, of those specializing in the eye, ear, nose and throat. Industrial medicine, a very live subject at the present time, and destined to become more and more important, is dealt with not only generally but specifically on the forenoon of the first day.

A question of national importance to Canada is that of an increase of population. Public bodies, political and otherwise, are constantly debating this question and see in it the only remedy for the development of the natural resources of the country, and for the solution of the railway and taxation problems. The Thursday afternoon symposium on "The Problem of More and Better Children" will be the Association's contribution to this vexed question, discussing, as it were, "Home Production versus Immigration." On Wednesday afternoon there will be presented by specialists in each subject, a series of short authoritative papers on "Recent advances in the Treatment of Organic Disease." These papers will sum up in succinct form the possibilities of treatment in conditions constantly met with by the general practitioner. Added to the above will be the presentation of interesting and valuable addresses or papers by Sir Robert Jones, Wm. J. Mayo and Sir William Taylor. The eye, ear, nose and throat specialists have seized this opportunity not only to present a sectional programme throughout the duration of the meeting, but to definitely and permanently establish themselves as a section of the Association with their own officers. The Canadian Society for the Study of Diseases of Children will hold its first annual meeting on the Friday and Saturday immediately following the general sessions of the Association. The affiliated Societies of Anaesthetists and Radiologists are turning out in force and the Medical Protective Association will hold its annual meeting at a date which will be announced in the final programme.

So much for the scientific side of our annual meeting. But what of the chief function of the Association, that of safeguarding and improving the welfare of the medical profession and through it of the Canadian people? The Committee on Inter-provincial Relations has been active and will present a report for consideration. Dr. M. T. MacEachern, Chairman of this Committee, will deliver an illustrated address upon what the

Canadian Medical Association stands for, and the Committee on Federal Legislation has met and has a report ready.

A service bureau, under the control of Dr. MacEachern and Dr. Routley, Acting General Secretary, will be maintained in a spacious room adjacent to the registration and meeting rooms, for the purpose of discussing with members and potential members, the activities and privileges of the Association. The "Question and Suggestion Box" will be featured. Finally, a financial report will be presented which it is hoped will be gratifying to all the members as it is to those who have had the charge of our finances. Space forbids any comment upon other features of the meeting. The reader is referred for these details to the programme itself.

BALLANTYNE AND THE NEW MIDWIFERY

THE need of pre-natal care for the pregnant woman is now so universally accepted that it is difficult to believe that it is an idea with a history of but one generation, and due in no small measure, to one, who from a worldly standpoint, was comparatively undistinguished. On January 3rd of this year there died at Edinburgh, Professor J. W. Ballantyne, Lecturer to Women Students at the University of Edinburgh, to whom we owe, if not the phrase, the important underlying thought, for which the English speaking world owes a debt that can only be repaid by the homage of children yet unborn. For a generation Ballantyne's absorbing idea was the necessity for the study of intrauterine conditions during foetal life, and it would seem as if death had taken him at the moment when his unrealized dream was becoming a reality to the more enlightened members of the medical profession.

Ballantyne's first works dealing with ante-natal pathology date back to 1892. In 1908 the writer visited him in Edinburgh with a letter of introduction from a distinguished obstetrician, in whose opinion Ballantyne was one of the men particularly well worth meeting. The visit was a great surprise to Ballantyne, who expressed a most simple delight in the way he had been singled out as an outstanding figure by the writer of the letter, and to his visitor, who found an obstetrician caring comparatively little for the problems of labour but intensely interested in the anatomy and physiology of the foetus up to the time of birth; an idea so unusual that its distinguished propounder seemed to have been forgotten in the race for university preferment, and who had to complain that so much of his day was occupied by the trials of daily practice.

In 1914, the writer visiting Edinburgh for the second time in company with a number of American obstetricians, asked as did others for Ballantyne but none of us had the opportunity of meeting him. Indeed, to the time of his death, Professor Ballantyne had made comparatively little mark in university circles in Edinburgh; certainly his university standing had not placed him in a position to avoid the drudgery of practice and enable him to devote more of his time to his scientific work.

A recent editorial in the *British Medical Journal*, April 14, 1923, commenting on an address delivered at Nottingham shortly before his death, attempts in some measure to atone for this neglect and accord to this pioneer praise that might have helped more had it been given during his lifetime.

The address itself is brief; there is very little of the ego, but very much of that excellent English based upon a sound classical education for which all Ballantyne's writing was remarkable. The title "The New Midwifery: Preventive and Operative Obstetrics" is more or less explanatory, but herewith is a brief summary.

The new midwifery is essentially preventive and reparative, and in a sense is new only from the point of view of disregard of time limit, adding to the preventive and reparative care *at the time of labour,* ante-natal and post-natal supervision. It is less dramatic, less spectacular, but infinitely more comfortable and less exacting. It is wrought with possibilities of life saving; of disease and disability preventing; it brings new responsibilities but new triumphs.

Its acceptance is imperative, since the National Insurance Act, the Notification of Births' Act, and the Midwives' Acts for England and Scotland, have brought the Maternity Hospital directly into association with organizations formerly more directly associated with Public Health, demanding therewith a new responsibility for care during pregnancy and after labor. The extent of this change is remarkable, calling as it does for the development of ante-natal clinics, ante-natal wards, dental clinics, venereal disease clinics, venereal disease wards, post-natal clinics for the teaching of mothercraft to women, special wards for premature babies, and beds for reconstructive (gynaecological) work, side by side with the lying-in wards. Under the new system the Maternity Hospital must either expand tremendously, or be in close association with the facilities of a large General Hospital and still more closely allied with government supported organizations concerned with public health and venereal disease. In England the Child-Life Investigation Department of the Medical Research Council is the supervising body. "The pregnant, the parturient, and the puerperal woman and her infant have passed under the aegis of the public health authorities just as surely as the fever patient, the tuberculous patient, the insane, and the school child."

What is the result? Primarily, a tremendous amount of relief from anxiety for the mother during pregnancy, and after her delivery. Not only relief from anxiety, but relief of actual suffering which for many years women have believed to be indissolubly connected with child bearing. There will be also greatly improved statistic results in the toxaemias of pregnancy; in syphilic disease, and in heart disease associated with pregnancy. "The new idea is to cure any disease which complicates pregnancy or so ameliorate it that the pregnancy may continue and a living child be born to a restored mother.......and to write down so-called therapeutic abortions as a failure." Moreover, the number of normal labours will be increased, abnormal presentations or positions will be manifest before the onset of labour, so that there will be a decrease in the number of still births, and a fall in the maternal death rate;the greater, owing to the spread of these methods among the public at large.

While the change from old to new has been a matter of a generation, its most marked advance was during the War when the value of a virile population made itself manifest. Altered conditions have been recognized by the General Medical Council who are undertaking concentrated teaching in associated subjects; diseases of women, obstetrics, and hygiene, having in mind the above mentioned thought that all diseases in pregnancy should be cured in pregnancy without the artificial ending of the pregnancy. The practitioner must learn to make at least as thorough an examination of a pregnant woman as of a candidate for life insurance, and must follow up his patient with a disregard for the time involved By so doing he will obtain as a result a satisfactory decrease in his cases of toxaemia, and his destructive operations. Eventually he will learn to make use of the facilities which are daily being added to institutions in the departments of hygiene and preventive medicine. He will also appreciate the important rôle played by venereal disease in all its aspects with abortion and in the causation of still births

In the course of its comment on the address the *British Medical Journal* notes that the national importance and significance of his ante-natal observations were for many years not fully realized especially as regards the loss of population from intrauterine disease. It points out that Ballantyne has shown that a large and unsuspected proportion of foetal deaths during birth are due to weakness from ante-natal disease, or prematurity, or the non-recognition of the relative size of the child in the pelvis of the mother. This is his so-called "intra-natal mortality". It is also noted that Ballantyne in his life time conclusively demonstrated the value of his ante-natal researches by reducing the still birth mortality of his cases fifty per cent. The various points emphasized in this address are worthy of careful consideration by every practitioner interested in midwifery. It is not essential that one should be in agreement with all of the methods suggested by Ballantyne, but it *is* essential that practitioners at large should realize the trend of modern obstetrics and the necessity for readjustment of many of the methods in current use with those dictated by his policy of progress. H. M. L.

MENINGEAL HAEMORRHAGE OF THE NEWLY BORN

THERE is general agreement that the most frequent cause of death in the new-born infant is intracranial hæmorrhage. This has been demonstrated by Warwick and others by postmortem examination of a series of infants who died just before or just after birth. While trauma and asphyxia have been considered the chief causes of the hæmorrhage, a certain proportion of cases is undoubtedly due to hæmorrhagic disease of the newborn. Few observers now agree with Virchow in considering the hæmorrhage secondary to an infective meningo-encephalitis.

Sixty years ago Little, an orthopedic surgeon, invited his obstetric friends to co-operate with him in an endeavour to discover the cause and means of prevention of spastic paraplegia. Since that time many investigators have demonstrated the relationship between birth injuries with meningeal hæmorrhage and so called Little's disease.

Cameron and Osman of Guy's Hospital have recently contributed an interesting article on "The Late Results of Meningeal Hæmorrhage in the Newly Born." These authors emphasize the importance of distinguishing between children in whom the paraplegia or diplegia is the result of defective cerebral development, and those in whom it is due to meningeal hæmorrhage. The whole personality of the former group is of a low type; they are idiots or imbeciles and will always remain so. The hæmorrhagic group, however, are capable of a high degree of mental development, and show great perseverance in an endeavour to overcome the handicap which retards their progress.

After the primary symptoms which develop almost directly after birth, these children who survive pass through a period of latency before the evidence of spastic paralysis becomes manifest. The explanation of the latent period is found in the development and physiology of the central nervous system. All movements of the normal infant are at first reflex in character. The psychomotor centres of the brain are not developed and the nervous mechanism at work is almost entirely that of the medulla and cord. Lesions of the cortex for this reason are relatively silent and only come into play at a later date, as compared with lesions affecting the medulla which are immediately fatal. As education and development in infancy proceeds almost entirely through the sensorimotor paths, these children are as a consequence greatly retarded and are often mistaken for imbeciles, when in reality they possess normal intelligence and in later years may learn with great rapidity by means of the eye and ear. The physician must therefore carefully distinguish between those cases which are primarily mental defectives and those who are only temporarily retarded by means of their sensorimotor handicap. The latter are capable of high intellectual development albeit they remain crippled for life, even as was the fate of Lord Byron. L. M. L.

THE PROBLEM OF THE FEEBLEMINDED

IN a pamphlet recently issued by the Toronto Mental Hygiene Committee the problem of feeblemindedness in Toronto is discussed. The seriousness and the size of this problem is very clearly and concisely set forth. That the facts which are presented are correct cannot be doubted as they are vouched for by some of the leading psychiatrists of Canada. The facts are also not pleasant reading and they become worse when we know that what is true of Toronto is true of all Canada. The surveys conducted by the Canadian National Committee for Mental Hygiene have shown that not one section of Canada is exempted from this problem. It is a problem which has been long neglected by our Federal Governments, Provincial Legislatures and by the medical profession.

One paragraph in the above mentioned pamphlet is of especial interest at the present moment when everyone is demanding a larger population for Canada. It is entitled "Mental Defect and Child Immigration" and reads in part as follows: "In one clinic in Toronto alone, 128 cases of adults who were brought over by one organization as child immigrants were examined; 27 of these 128 were socially diseased; 42 were confirmed prostitutes; there was a total of 94 illegitimate children born of them, and on examination, 95 per cent were found to be abnormal . . . It would seem, . . that a good many children are slipping past the immigration authorities, and later constitute a very serious problem to Toronto."

What is true of Toronto is true of every part of Canada and especially of the Western provinces which receive the largest percentage of our immigrants. It is true that we need population but do we want immigrants whom we will, after a few years, have to support in feebleminded institutions, mental hospitals or epileptic farm colonies? It may be stated by some that we must allow a certain number of the high grade feebleminded persons into Canada in order to have a certain class of unskilled labour done or that a feebleminded woman might be able to do domestic work satisfactorily when it would not be possible for her to pass the intelligence tests. All this may be perfectly true and it is a large as well as difficult problem to solve. Not only is the problem of economics involved but but also that of eugenics. What is necessary is for the Immigration Department to consult the leading medical men familiar with this problem and then formulate a set of rules for the guidance of the Immigration Medical Inspectors. Another method in all cases of doubt would be to allow all suspected persons in under bond as is permitted at present, but increase the number of medical men who could examine these persons to see if they were turning out good citizens. It is a large problem which should be taken up vigorously by the medical profession who should insist on effective measures to promptly prevent the influx of feebleminded persons in Canada. The immigration side of the problem is most important but what can be done with the feebleminded at present in Canada? This side of the question has also been largely neglected by the medical profession, although there are signs that it is slowly being recognized as a large field of preventive medicine, through which the spread of venereal disease, the birth of unhealthy children, the increase of crime and juvenile delinquency, etc., can be prevented. Institutions for all the feebleminded in Canada could not, even if it were necessary, be built. We will always have to have institutions for a certain type of feebleminded, but a large number of them if given the right kind of instruction early in life and proper supervision later will never have to be committed to an institution. An adequate plan should include identification, registration, instruction and supervision of all feebleminded persons. Identification could be accomplished through examination of all school children, particularly in those provinces where compulsory education is in force, and through the establishment of mental clinics in all important centres of population. Registration would be easily obtained after identification had been assured. Instruction would mean the building of institutions for a certain number of feebleminded, especially the low grade and anti-social types. The best method of making these persons into good citizens, however, is through the formation of special classes in the public schools. In these classes they would be taught according to their capabilities and not as if they were of normal intelligence.

Furthermore trade schools should be established for children over twelve years of age. It has been found in cities where these special classes have been organized that as high as 75 per cent of the children become self-supporting. The Western provinces were the first to realize the seriousness of the problem of feeblemindedness and they have taken a very advanced step in the care of these people. Toronto and other parts of Ontario have also appreciated the problem and are providing means to combat it. To-day our institutions for the insane, feebleminded and epileptic are crowded with persons of foreign birth who should never have been admitted to Canada. It is a question that should be thoroughly studied by the medical profession and through it every provincial government should be made to realize its responsibility in this serious problem. G. S. M.

Editorial Comment

NEW SERVICES IN PREVENTIVE MEDICINE THAT MAY BE RENDERED BY LIFE INSURANCE COMPANIES

In an address presented before the Life Underwriters of Ontario, Dr. H. W. Hill, Dean of the Faculty of Public Health in Western University, made a strong plea that Life Insurance companies should undertake more in the way of preventive medicine for their policyholders than they are at present attempting. Three well known professions, namely, the medical profession, public health officers, and life insurance companies, are all peculiarly interested in the prevention of disease, in the promotion of health, and in the attainment of a good old age. The prevention of disease rather than the cure of the sick is constantly looming larger in the medical mind. The important interests of insurance companies, like the real interests of the physician, lie in securing longer life with better health for their clients. The longer the life of the policy-holder and the better his health, the less becomes the expense of insurance. Thus life insurance, the medical profession, the department of public health, and the general public have a mutual interest in conserving life and the health of the community. Life insurance, however, was the first to recognize not only this humanitarian aspect but also the economic advantage of maintaining the health and in this way of prolonging the life of their policy-holders.

There are three definite ways in which life insurance companies can act and should act for their own benefit, to the advantage of their policy-holders and also of the medical profession. These three ways are as follows: 1.—Education of the public in matters relating to public health and protection from disease; 2.—Medical supervision by methodical examination at stated intervals of individual policyholders; 3.—Standardization of community health activities. These three definite steps here proposed for the insurance companies to follow are intimately connected and are all at bottom of an educational character. At present education along these lines is being attempted by pamphlets, but it can be done better, more directly, and more efficiently by demonstration, by personal interviews, and by visits to domiciles through the aid of a visiting nurse. The insurance public health nurse should not wait for disease to develop before advice and relief are given, but should visit regularly all policyholders, those well and those ill, seeking to maintain or improve health by advice on matters of hygiene and sanitation. The insurance public health nurse cannot cover this great field alone, although as an investigator, adviser in the home, and discoverer of early disease symptoms, the well trained nurse is invaluable; the insurance public health physician is equally necesary. He should provide for treatment, preventive and curative, at the earliest incipient stage of disease. Such work has been done hitherto on a voluntary irregular basis, without uniformity. Dr. Hill proposes it be made a definite item in every policy-holder's life. Here is public duty of the highest type, maintaining the financial prosperity on which rests the success of public health effort and yet combining to lessen its cost and widen its use by the public. Canadian life insurance companies are vitally interested in all this; in prolonging life, and in preventing disease in the same way as fire insurance companies are in preventing fires. They should no longer neglect this great field. Life insurance should investigate the machinery in each community for promoting health and preventing disease, and demand public health protection in accordance with the findings established. No such service is at present attempted by any organization, official or otherwise. Fire insurance societies could not operate without this precaution, which life insurance companies wholly omit. Here we have a direct business proposition, tying up annual physical examinations and public health problems with life insurance. In this way we place the public health of the future on a sound economic foundation; only the financial knowledge and organization, and the acquaintance with the actual facts of life, death and disease, possessed by life insurance companies can solve its problems.

The Federal Department of Health has just issued a brochure on SANITATION dealing with the subject of sewage treatment for isolated houses and small institutions where municipal sewage system is not available. The urge for such information has been so insistent and, having in mind the health and welfare of the people, it was considered advisable to have the subject dealt with in a scientific and thoroughly practical manner. The publication is generously illustrated, emphasizing the application of the advice given.

Homesteaders, summer cottagers and trustees of small institutions, are strongly advised to avail themselves of the information contained in this publication, which can be obtained free on request from the Deputy Minister, Department of Health, Ottawa.

The Role of Transillumination in Diseases of the Nasal Accessory Sinuses.—In order to appreciate the valuable aid obtained by transillumination in diseases of the maxillary and frontal sinuses, Edward L. Pratt, New York, suggests that these points be kept in mind: (1) It must be used as a routine part of every nasal examination. (2) Its evidence is not infallible, but must be correlated with the other signs of sinusitis—the history, the presence and location of pus in the nose, and the appearance of roentgenograms. (3) Positive findings always merit full investigation, even puncture and irrigation. (4) Negative evidence on transillumination does not rule out sinusitis in the presence of other positive signs. (5) Due allowance must be made for the degree of illumination to be expected in patients with thick bones as compared to fair skinned, thin walled patients. Patients who have had one or more previous attacks of sinusitis with a resultant thickening of the mucous membrane lining the sinus will often illuminate with varying degrees of darkness, even though no secretion is present in the sinus. When used in this manner, the accumulated experience obtained by routine daily use will prove transillumination to be a most valuable aid (1) for the general practitioner untrained in nasal examination; (2) as an indication that something more than the ethmoid sinuses is involved; (3) as a check on the interpretation of roentgenograms, and (4) as an indication of the progress of treatment.—*Jour. Am. Med. Assoc.*, April 21, 1923.

Men and Books

SIR CHRISTOPHER WREN (1632-1723)

The present twelvemonth is particularly memorable in its anniversaries. Three hundred years ago the First Folio of Shakespeare was published; two hundred years since, on February 25, 1723, died Sir Christopher Wren, the greatest English architect, though excelled in some particulars by Inigo Jones; a hundred years ago Pasteur was born; and within the same year Edward Jenner, the discoverer of vaccination, was buried.

Wren was the son of the Rector of East Knoyle, Wiltshire, and was born there in 1632. He was educated at Westminster and in 1649 entered Wadham College, Oxford, graduating B.A. and later M.A. (1653). At the early age of twenty-five he was appointed to the chair of astronomy at Gresham College, London, and in 1660 was elected Savilian professor of astronomy at Oxford. In 1665 he visited France for some months. Although Wren had built a doorway at Ely Cathedral in 1663, and his model for the Sheldonian Theatre at Oxford had been submitted and approved in the same year, the saying that he "went to Paris an astronomer and returned an architect," is perfectly true. The great fire of London occurred in 1666, and Wren was appointed "surveyor-general and principal architect for rebuilding the whole city; the cathedral church of St. Paul; all the parochial churches......with other public structures." His plans for doing these things were not carried out in full, but he did build fifty-two churches, many of the halls of the City Companies, and he also designed the new house of the Royal College of Physicians in Warwick Lane after that in Amen Corner had been burnt. It would seem to one visiting London that much of its charm is due to the skill and mastery in building of this one man. Wren died at the age of ninety-one, and lies buried in St. Paul's, where, only the other day, a memorial service was held in his honour. The epitaph: "The builder of this church and city, if you would see his monument look around," expresses for all time the regard in which he was held.

Wren, however, was much more than a great designer and builder, and his interest for us lies also in the fact that, before he became deeply engrossed in his life's work, he was a "prodigy by reason of his scientific attainments." During the interval between leaving school and going up to Oxford, this young lad was chosen to assist Sir Charles Scarborough, a close friend of the immortal Harvey, in his demonstrations, in making anatomical preparations, and in various experiments for his lectures on anatomy at Surgeon's Hall. Wren's mathematical knowledge was quite remarkable, even at a tender age, and he was much interested in the mechanics of muscular action, later forming models in pasteboard to illustrate the motion of muscles. These were lost at the fire of London.

When Wren was at Oxford there was a galaxy of talent devoted to the study of natural philosophy by means of observation and experiment, and these men, who had met before the Civil War in London, used to hold discussions in a room of Wadham College. Later, in 1660, they founded the Royal Society. Amongst those with whom Christopher Wren associated were, Dr. Wilkins, Warden of Wadham, Robert Boyle the chemist, Richard Lower and John Mayow physiologist, and Thomas Willis the anatomist and physician. Sometimes when Wren was lecturing at Gresham College in London, the meetings were held in his rooms there.

It was no age of specialism and all branches of natural philosophy lay in their rightful field of inquiry. Dr. Thomas Sprat in his *History of the Royal Society* (1667), writes of Wren: "He was the first author of the Noble Anatomical Experiment of Injecting Liquors into the Veins of Animals. An Experiment now vulgarly known; but long since exhibited to the Meetings at Oxford, and thence carried by some Germans, and published abroad. By this Operation diverse Creatures were immediately purg'd, vomited, intoxicated, kill'd, or revoked, according to the quality of the Liquor injected: Hence arose many new Experiments, and chiefly that of Transfusing Blood, which the Society has prosecuted in sundry instances, that will probably end in extraordinary Success.'' Wren used such drugs as scammony, opium, and wine. He was a man of ideas but it is not likely that he did more than suggest the possibility of direct blood transfusion. It was left for Richard Lower to do this from one dog to another in 1665, and the silver cannula he employed is depicted in ''table 7'' of his *Tractatus de Corde*, Amsterdam, 1669 in 8⁰.

Christopher Wren was a fine draughtsman and he made the illustrations for the *Cerebri Anatome*, (1664) of his friend Thomas Willis. He was also the first man who made drawings from the microscope.

Wren was an inventive genius and in the breadth of his work reminds us of Leonardo da Vinci. Hook wrote of him: ''I must affirm that since the time of Archimedes there scarce ever met in one man in so great a perfection, such a mechanical hand and so philosophic a mind.'' He invented a machine, drawn by a horse, for planting seeds in fields, a method of making fresh water at sea, a way of purifying and fumigating sick rooms, a means of curing smoking chimneys, a self-registering weathercock, a self-registering thermometer. He constructed a model of the eye as large as a tennis ball with the humours truly and dioptrically made, invented a new way to grind glasses, invented new musical instruments, and designed engines of war.

Even after Wren was devoting nearly all his energies to architecture, he writes to Sir Charles Scarborough about various anatomical dissections and of the operation of splenectomy in a dog. He was president of the Royal Society from 1680 to 1682 inclusive. Here was a man busy rebuilding London, but in his inaugural address he exhibits his enduring enthusiasm for scientific medicine and some of his remarks sound strangely modern in our ears. He urges the physicians of the society to keep an account of epidemic diseases and to note the effect of weather upon medicine, and, instead of relying on the vanity of prognosticating, he wished men to have the patience for some years of registering past times, ''which is the certain way of learning to prognosticate.'' Wren also saw the importance of biochemistry: ''Thus in the body of a man if we consider it only mechanically we may indeed learn the fabric and the action of the organical parts, but without chemistry we shall be at a loss to know what blood, spirits, and humours are, from the due temper of which (as of the springs in the barrel wheel) the motions of all parts depend.''

Had this man with the quality of genius—the capacity for taking pains—been able to continue his philosophical disputes, he surely would have secured for himself a scientific position higher than was obtained by any of those of his time, with one exception—Newton

A. M

Alcohol and Disease.—Since the debate regarding the prohibition of the manufacture and sale of alcoholic beverages has hinged largely on the scientific aspects of the liquor problem, every pronouncement on the subject is awaited with interest. Recently a statistical report regarding the possible influence of alcohol on the prognosis of pneumonia in a large municipal hospital was published in *The Journal*. The data for nearly 3,500 cases of lobar pneumonia showed, with reference to the patients' habits of indulgence in alcoholic drinks, that the mortality was higher in moderate users than in light users or abstainers, and that the mortality in excessive users was much higher than in moderate users. It seems important to define the limits of interpretations to be made from these data. The investigators themselves insisted that their findings demonstrate only what a harmful effect the use of alcohol may have on the course of a disease. They have no bearing on the question whether legislation has or has not diminished the prevalence of drinking. In commenting on the paper referred to, a prominent newspaper pointed out further that the statistics have no bearing on the possible use of alcohol in therapy. It cannot be too strongly emphasized or too frequently reiterated that alcohol, like many drugs, may have a usefulness in medicine which by no means justifies the assumption that it is of equal value in dietetics. Strychnine is recognized as a helpful drug and also as a deadly poison. Hydrochloric acid can act as a violent corrosive; it may also facilitate gastric digestion. The contradictions are in the statements of persons, and not in the facts of science.—*Jour. A.M.A.*, April 7, 1923.

Correspondence

THE IMPORTANCE OF POSTURE, IN THE PREVENTION AND TREATMENT OF CONSTIPATION

To the Editor: Sir,

Although we have in the alimentary canal a long muscular tube in which many different chemical activities are carried on, to assist which effective propulsive action by the muscular coat is a necessity. In many this muscular action is defective and I am of the opinion that it can be considerably assisted by the force of gravity if we properly recognize the direction in which gravity can act.

In the small bowel the contents of this canal are so liquid that propulsion is easily effected. By the time the contents reach the transverse colon they have become distinctly inspissated. Assistance to the movement through this portion of the bowel may in my experience sometimes be obtained by gravity if the person will lie during the later hours of the night on his left side; upon rising in the morning gravity may again become of assistance in the descending colon and possibly in the sigmoid and rectum. The simple maxims I give my patients in the treatment of constipation are the following: 1.—To imbibe lots of fluids and fresh air, and eat good, coarse food; 2.—To take vigorous abdominal exercise, and to assist the normal propulsive movement of the bowels by sleeping the first part of the night on the right side, and during the later half on the left.

Franklin, Man. J. R. B. Fraser, M D.

Specific Treatment of Hay-Fever During the Attack.—In three cases of autumnal hay-fever, with sensitization to short ragweed, reported by Warren T. Vaughan, Richmond, Va. (*Journal A. M. A.*, Jan. 27, 1923), the patient had been desensitized by the routine commonly followed, both parenteral injection and nasal installation being employed. One patient developed hay-fever in a very severe form; while two were decidedly improved but not symptom free, after the onset of the pollen season. In all three cases, symptoms cleared up almost entirely following daily subcutaneous injections of small amounts of ragweed pollen extract. A fourth patient, a boy who had developed hay-fever for the first time and had had no preventive inoculations, did equally well following daily subcutaneous treatment. The frequency of inoculations was gradually reduced in this case, the patient remaining greatly improved. According to the method proposed, patients presenting themselves for the first time during the pollen season, and without previous treatment, may be treated by specific measures, with considerable hope of relief.—*Jour. Am. Med. Ass.*, Jan. 27, 1923.

Congenital Atresia of the Esophagus, with Esophagotracheal Fistula.—In one of the cases reported by Edward Weiss, Philadelphia, there was atresia of the esophagus, the upper portion being dilated and ending in a blind pouch about 1cm. above the bifurcation of the trachea. The lower segment was smaller in diameter and entered the trachea posterolaterally just above the bifurcation. A probe passed into the upper end of the trachea entered the lower segment of the esophageal and passed readily into the stomach. In the second case the esophageal anomaly was almost identical with that noted about 1 cm. above the bifurcation of the trachea, and the lower segment opening into the treachea directly opposite the point at which the upper segment of the esophagus abruptly ended. In the third case the roentgen-ray examination revealed a complete stenosis of the esophagus at the level of the third dorsal vertebra. The esophagal anomaly disclosed at necropsy was nearly similar to the other two.—*Jour. Am. Med. Ass.*, Jan. 6, 1923.

Abstracts from Current Literature

MEDICINE

Influence of Various Symptoms in the Prognosis of Pulmonary Tuberculosis.
Trudeau, F. B., *Jour. A.M.A.*, March 24, 1923.

By obtaining the after-history (up to 1918) of 980 patients admitted to the Trudeau Sanatorium the author has been able to judge of the prognosis of certain symptoms. The terms "well," "living," "dead" and "unknown" are used in the tables. The mode of onset (catarrhal, insidious, pleuritic, febrile, and with haemoptysis) plays no part in determining the future course; the "wells" varying from fifty-eight to sixty-eight per cent. and the deaths from twenty to twenty-seven per cent. The presence or absence of tubercle bacilli in the sputum is very important in the question of prognosis: fifty per cent. of the patients whose sputum was positive are well and working as against seventy-nine per cent. among the negative cases; the mortality amongst the "positive" cases after a period of from five to eleven years is thirty-two per cent. as compared with six per cent. amongst the "negative' ones.

It is surprising that definite haemoptysis (as indicated by the spitting of one teaspoonful or more of blood) was found not to warrant such a grave prognosis as had been thought. Sixty-one per cent. of the "positive cases" are well and twenty-three per cent. died; sixty-five per cent. of the "negative" cases are well and twenty-two per cent. died. A gain in weight augurs well, for sixty-seven per cent. of those patients who gained are well and twenty per cent. died; whilst fifty-seven per cent. of those who lost in weight are well and twenty-seven per cent. died. In considering the prognosis of a rapid pulse only those cases were classed as "positive" where there was a pulse rate of 90 or over, persisting for five consecutive days without any other cause beyond tuberculosis being found. Sixty-nine per cent. of the "negative" patients are well and working, and only sixteen per cent. are dead; forty-nine per cent. of the "positive" patients are well and thirty-eight per cent. are dead.

Fever (i.e., temperature of 99.5°F. for five consecutive days without any apparent cause other than tuberculosis), which generally goes with increased pulse rate, is the gravest of all the symptoms. Forty-three per cent. of febrile patients have died and forty-five per cent. are well; sixty-eight per cent. of the febrile patients are well and working and only seventeen per cent. are dead. Seventy-eight per cent. of those who had incipient tuberculosis have resumed normal life while less than ten per cent. have died. There are twenty-five per cent. of "wells" amongst those who were far advanced cases. Out of 980 patients who were admitted to the sanatorium seventy-five per cent. are well and living at a date varying from five to seven years after discharge, and two out of every three are earning a living.

ARCHIBALD MALLOCH

Sudden Death Following Thoracentesis.
du Bray, E. S. *Am. Jour. Med. Sc.*, March, 1923.

The author reviews briefly previous literature on the subject and the article contains a good bibliography. Capps has shown by ingenious experiments that the healthy pleura tolerates irritation, whereas an inflamed pleura reacts to it, whether mechanical or chemical, by well marked reflex circulatory disturbances. "The pleural reflex may act on the cardioinhibitory fibres of the heart through the vagus nerve-endings or on the vasomotor centres through the sympathetic nerves." The resulting collapse is often called "pleural shock."

Other cases of collapse are definitely due to pulmonary lesions produced by thoracentesis, such as air embolism, when, after death, gas bubbles may be found in the blood vessels at the base of the brain; pulmonary oedema, the exact mechanism of the production of which has not yet been ascertained, although there are possibly a number of causes; pulmonary thrombosis following puncture of the lung with embolism to the heart or brain. Pulmonary hæmorrhage with or without haemoptysis may also cause death: pneumothorax rarely causes serious symptoms.

The writer reports a case in which death followed twelve hours after exploratory thoracentisis. Nothing was found in the clinical examination or at the autopsy to suggest air embolism.

at the post mortem a puncture wound of the middle lobe of the right lung was found surrounded by hæmorrhage, congestion and extensive pulmonary oedema. The fatal outcome was apparently due to congestion of the lung parenchyma plus oedema of the lung with secondary circulatory reflexes. ARCHIBALD MALLOCH

Quinine Idiosyncrasy and Cinchonine. Fletcher W., and Travers, E. A. O. *Brit. Med. Jour.*, April 14th, 1923.

In the experience of the authors, one of whom has been in the Malay States for twenty years, idiosyncrasy to quinine is much less common than the textbooks say. They have seen only one case and it does not seem certain that the exfoliative dermatitis was due to quinine or to some other cause. A lady, aged thirty, was taken ill with benign tertian malaria on June 10th, 1922. She was treated with 30 grains of the acid hydrochloride of quinine intramuscularly every day for three days. Subsequently she received till July 4th, 45 grains of quinine daily in a mixture containing 15 grains of quinine sulphate and 3 minims of the hydrochloric solution of arsenic in each dose. Three weeks after quinine was first taken, a blotchy rash appeared on the face, neck, arms and hands and continued for eight weeks. Then the skin of the whole body was swollen, red, dry and peeling: the face was bloated and her eyelids so swollen that she could scarcely open them. There were bullae about the mouth and the tongue and the buccal mucosa and throat were inflamed and painful: the general appearance suggested exfoliative dermatitis due to arsenical poisoning. The temperature was 102°F., and subtertian parasites were found in the blood.

As it did not appear that the patient could take quinine, 16 grains of cinchonine base were given daily in 4 grain doses in gelatin capsules. The vomiting ceased, the temperature was lowered, and the parasites disappeared from the blood. The rash disappeared, but the skin was left pigmented—not over the abdomen as in arsenical poisoning. Under a lessened dosage, cinchonine base was continued until November, and the patient left soon afterwards for England in good health.

McGilchrist has shown that the several alkaloids of cinchona vary in their toxic properties, and Acton claims that the members of the laevo-rotatory group, which includes quinine, have different therapeutic properties from those in the dexto-rotatory group, which comprises cinchonine and quinidine. The authors think it unlikely that in every case of quinine idiosyncrasy the sensitiveness is limited to one or other of the cinchona alkaloids, but in this instance as soon as cinchonine was substituted for quinine the alarming signs and symptoms disappeared.

ARCHIBALD MALLOCH

Arterial Hypertension. Hartweg, E. *Zentralbl. f. inn. Med.*, December 23rd, 1922.

The writer mentions the diseases which may cause high blood pressure, and discusses the cases of high blood pressure in elderly people which are not associated with disease of the kidneys or heart' This last form is described as essential hypertonus; it is regarded by some authors as a sign of commencing kidney affection, since in course of time in some of these cases albuminuria is detected. But the author shares the view of those who consider the subsequent kidney condition to be the result of the high blood pressure. The condition is caused by primary vascular constriction, and as a result of the high blood pressure both arterio-sclerosis and granular kidney may develop. Chronic abuse of tobacco is very often the exciting cause of the high blood pressure. Assuming these views to be correct, the author points out the importance of the treatment of high arterial tension. In addition to physical, dietetic, and psychical treatment, the employment of vaso-dilators is indicated, and of these the author thinks yohimbin deserves special mention. It dilates the peripheral arterial system and neutralizes vascular spasm of sympathetic origin. Through the use of this drug the development of arterio-sclerosis and granular kidney is thought to be prevented or at least postponed. The author states that his experience confirms this view.

(*Brit. Med. Jour.*)

Age at Death of Parents of Tuberculosis and Cancer Patients. Pearl, R. *Am. Jour. of Hygiene*, December, 1922.

A study of the question of the ages at death of the parents of the tuberculous and the cancerous, on the basis of critically collected new material, shows that, for completed lives (parents dead), the mean age at death of the parents of a group of tuberculous persons is significantly, but not greatly (from two to four years), lower than the mean age at death of the parents of a group of non-tuberculous persons having the same age distribution as the tuberculous group. The same thing is true of the fathers of a group of cancerous persons. The experience for mothers of the cancerous is too meagre to give definite results. In so far as duration of life may be taken statistically as an indicator of soundness of biologic constitution, it follows that in some degree, though not considerably, both the tuberculous and the cancerous are of weaker stock constitutionally than those not having these diseases. Incidentally, the results of this investigation, as they are interpreted by Pearl, furnish new evidence of a different sort than any heretofore offered, on the question of the inheritance or duration of life.—*J.A.M.A.*, Jan., 1923.

"Glandular Fever." Longcope, W. T. *Amer. Journ. Med. Sci.*, December, 1922.

The author points out that under the terms "glandular fever," "infectious mononucleosis," and "acute benign lymphoblastosis" cases have been described which present somewhat similar symptoms. He records ten cases which he describes by the term "infectious mononucleosis." The clinical features resemble those of "glandular fever" (described long ago by Pfeiffer, Dawson Williams, and others), but at present the exact relation, he says, is not settled. The onset is gradual, with headache and irregular fever, and often with pharyngitis, tonsillitis, or tracheitis. The cervical glands become enlarged, firm, and tender; frequently the axillary and inguinal glands are also affected; sometimes the spleen becomes enlarged and tender. The leucocytes in the blood increase in number from the seventh to the tenth or eighteenth day. The change is a mononuclear leucocytosis—an absolute and relative increase in the mononuclear non-granular leucocytes, with a decrease of the total number of granular leucocytes. Three forms of mononuclear leucocytes are found in all these cases: (1) small mononuclear leucocytes, (2) large mononuclear leucocytes (both similar to those seen in normal blood), and (3) mononuclear leucocytes of a type not usually seen in normal blood. The third type predominates. These cells are somewhat larger than the small lymphocytes, and contain oval, kidney-shaped, or slightly lobulated nuclei, usually without definite nucleoli, and often eccentrically situated in the cell. Sometimes the nucelus almost filled the cell; at other times it was surrounded by a considerable amount of basophilic non-granular protoplasm. The absence of the oxidase reaction differentiated these cells from myeloblasts. There is no anaemia. The fever rarely exceeds 102° or 103°; it continues irregularly until the tenth or twentieth day, and then gradually subsides, and the symptoms and blood changes then disappear. The uniform character of this febrile disease and the association of enlargement of lymph glands with a striking increase of mononuclear leucocytes of an abnormal type in the blood serve to differentiate the condition from other acute infectious diseases. The cause is unknown. The disease is of short duration, and recovery is the rule. It resembles most closely acute leukaemia, but may be differentiated by many characteristics—anaemia and purpuric spots are absent, and the abnormal mononuclear cells in the blood are different in their histological and biological characteristics from those in leukaemia. (*Brit. Med. Jour.*)

The Heart in Influenza. Menti, S. *Zentralbl. f. inn. Med.*, January 6th, 1923.

The author from his observations on 106 cases of influenza, came to the conclusion that this disease has a definitely injurious action upon the heart. Circulatory disturbances developed which had hitherto been latent, or in the case of valvular defect had been well compensated, and caused no symptoms. Diseases of the heart and vessels which had already caused some symptoms before the attack of influenza underwent a considerable aggravation. In a second group showing cardiac disturbance without any anatomical lesion a general asthenia was noted. In both groups there was a disturbance of pulse rhythm which Menti attributes to a change in the conductivity of the heart muscle similar to that which occurs in convalescence from diphtheria. The symptoms in both groups were very slow in disappearing, and ordinary treatment, especially digitalis, failed, so that Menti came to the conclusion that cases which did not react promptly to digitalis were due to influenza. If digitalis had to be given at all it was administered only in combination with quinine, caffeine, theobromine, belladonna, etc. (*Brit. Med. Jour.*)

PAEDIATRICS

Gastric Hyperacidity in Children. Kerley. C. G., and Lorenze, E. J., M.D. *Jour. Amer, Med. Assoc.*, Nov. 25th, 1922.

Hyperacidity is quite a common condition in childhood. The usual symptoms are abdominal pain, nausea, anorexia, and occasional vomiting. The pain is usually epigastric and most marked before meals, especially before breakfast. It may be colicky. Vomiting may occur at any time, but is most common after breakfast. Nausea occurs usually before meals and is often relieved by taking food. The appetite is variable, but usually poor. Often a few mouthfuls will satisfy and the child will have to urged to take more. Constipation results from the small food intake which may also lead to malnutrition and anaemia. Dietetic errors are responsible for the hyperacidity. Unsuitable food at frequent or irregular intervals and the over-indulgence in cake, candy and cream sodas are the usual errors, while orange juice before breakfast is a common cause. The normal evacuation time of a child's stomach is about four hours. Hypomotility and pyloro-spasm delay the emptying time and give rise to retention which in turn causes hyperacidity. Good appetite and normal digestion depend on rest period of at least half an hour before food again enters the stomach.

Sixty-seven cases of chronic stomach disorders were studied by means of a test meal and gastric analyses. Taking the normal acidity in children as ranging from 30 to 40 it was found that:

58 showed total acidity over 50
44 " " " " 60
36 " " " " 70
24 " " " " 80
3 " " " " 90
2 " " " " 100

Treatment.—Three full meals are allowed daily; at 7.30 a.m., 12.30 p.m., and 6 p.m., with a cracker at 3.30. Raw fruits, fruit juices, or condiments are forbidden. Food must be neither very hot nor very cold. No ice-cream or iced drinks. Sugar is to be used scantily. Half an hour before each meal the following powder is given in one-half glass of warm water:

Soda bicarbonate grs. ii
Bismuth subcarb. grs. ii
Magnesium carb' gr. i

If constipation is a factor, from 15 to 30 drops of aromatic cascara are given after each meal and *not* in one dose at bed-time. Results have been most satisfactory if the diet and medication are continued for months. There is always a tendency to relapse with any indiscretion in diet. L. M. LINDSAY

The Etiology of Acute Intestinal Intoxication in Infants. Boyd, Gladys L., M.B. *Arch. Int. Med.*, Feb. 15th, 1923.

Extracts of intestinal mucous membrance from cases of acute intestinal intoxication in children contain a toxic substance which, when injected into the peritoneal cavity of animals produce a definite symptom complex, consisting of depression and narcosis, anorexia, circulatory failure, frequent stools, and in some cases convulsions and death. Younger animals (rabbits, kittens, etc.,) were found to be more susceptible to this toxic substance than older ones, especially if previously dehydrated.

The toxin is not destroyed by boiling, and passes through a bacteria-tight filter, but boiled aqueous extracts of fresh stools proved non-toxic when injected into animals. The systemic blood from these patients was only slightly toxic when injected into animals. The portal blood however, was very toxic. Necropsies presented nothing distinctive, slight fatty changes in the liver and kidneys, and some alveolar hæmorrhage being the only abnormal findings. L. M. LINDSAY

The Relation of Chorea to Rheumatism. Nordgren, R. *Acta Paediatrica*, Dec. 16th, 1922.

The writer has made a statistical study of the incidence of rheumatic lesions and of chorea in children's hospitals in Stockholm between October 1st, 1908, and the end of 1921. As a table shows, the incidence of the two was remarkably uniform, and the author quotes Roger as saying that chorea, rheumatism, and endocarditis are three names for one and the same condition. Among the 343 cases of chorea there were 26 with a history of rheumatic fever, with or without valvular lesions, 161 with valvular lesions which could be traced to no other disease, and six with a history of endocarditis during residence in hospital. Thus 193, or more than half, showed definite signs of rheumatism. Other possible causes of the chorea were seldom found; there were only six cases with a history of scarlatina, and six others with a history of psychic shock. It was significant that during the epidemic of influenza in 1918 and 1919 there were very few cases treated in hospital. With regard to the sex distribution of chorea and other rheumatic affections, it was found that there were only 125 boys to 218 girls suffering from chorea. In the case of other rheumatic affections, however, the sex incidence was almost equal; there were 177 boys to 190 girls. The age for which chorea showed the greatest preference was between eight and ten, and there were as many as forty-three boys and seventy-seven girls within this age limit. (*Brit. Med. Jour.*)

DERMATOLOGY

The Treatment of Pruritis Ani With Bacterial Injections.

Knowles, F. C., and Carson, E. F. *Arch. of Derm. and Syph.*, April, 1923.

This is a short paper, with some discussion. The writers admit that they themselves can only report on a small series, eighteen in number: and also that only seven of these were treated long enough to allow of conclusions. But they refer to similar work of Drs. Winfield and Murray, who reported results in over 200 cases. Cultures taken locally in severe pruritis ani, give almost constantly *streptococcus fecalis*, along with the colon bacillus, and the idea arose that vaccines from these might be useful.

Results have been very favourable. Apparently stock vaccines of either organism were as effectual as autogenous. Sometimes it was found very useful to give both organisms, in other cases either one or the other gave results singly. In the work of these authors *streptococcus fecalis* vaccine gave the best results.

Large doses were used, up to as much as a billion at a time; small doses seemed to have no effect. The injections were given weekly, the period of treatment varying from twelve to twenty weeks. In the discussion it was pointed out that associated conditions must be treated and some thought that was very often sufficient. Also it was suggested that the injection used need not be specific, any protein being able to give a reaction which would relieve the itching. But the feeling was present that in this class of case the use of vaccines was of very considerable value.

H. E. MacDermot

SURGERY

Chronic Non-Inflammatory Lesions of the Knee Joint.

Henderson, M. S. *Arch. of Surg.*, Jan., 1923, p. 118.

After discussing the anatomy and physiology of the knee joint, the following lesions are discussed: (1) *Sprains.* Here the internal lateral ligament is generally involved. Damaged semilunar cartilage is ruled out by absence of locking. Rest for a few days, baking and massage are usually effective. If pain and tenderness persist, the inner side of sole and heel should be raised to remove the strain from the internal lateral ligament.

(2) *Rupture of the crucial ligaments.* This condition would seem to be infrequent. In the few cases seen by the writer, excellent function has been obtained by the use of a plaster-of-Paris cast in a slightly flexed position.

(3) *Intra-articular fractures of the knee joint.* Severe trauma may produce fracture of the tibial tuberosities or of the femoral condyles. Very little can be done for such patients. The condition of disability is usually not severe enough to warrant an ankylosing operation. When seen early such cases should be treated by early motion which is less painful when carried out under extension. It is doubtful whether an early open operation would secure better position of the fragments.

(4) *Recurring dislocations of the patella.* These are always outward. Reefing the inner capsule after lengthening the outer capsule acts satisfactorily. The condition is most commonly seen in women.

(5) *Old ununited fractures of the patella.* These are difficult to treat. The disability may be great or but slight. The fragments must be brought together without tension, even though the upper fragment is dissected entirely free and used as a graft to the lower. The gap left is obliterated by sutures, the fragments are held together by beef bone screws, kangaroo tendon or wire.

(6) *Intrinsic mechanical derangements of the knee joint.* Of these, the internal semilunar cartilage is the principal source, the loop or bucket-handle type of tear being most frequently seen. The external semilunar, thanks to its loose attachment at the periphery, usually escapes injury. Reduction by manipulation of a displaced cartilage is described, also the opera-

tion for its removal. Another source of mechanical derangement is the presence of loose osteocartilaginous bodies. These are produced by three conditions: 1. osteochondritis dissecans; 2. hypertrophic arthritis; and 3. osteochondromatosis. Osteochondritis dissecans rarely sets free more than one or two bony masses, usually from the internal condyle near the insertion of the posterior crucial ligament. The etiology of this condition is not yet clear. In hypertrophic arthritis, loose bodies are produced by the breaking off and dropping into the joint of marginal outgrowths. These wander about and increase in size; four or five may be present, usually in elderly persons. In osteochondromatosis the synovial membrane, from some developmental defect, takes on the property of forming osteocartilaginous bodies, which may reach a large number. We do not know why this occurs. The presence of loose bodies of any origin is an indication for their removal. Often this can be done under local anaesthesia. When the bodies are multiple the split-patella route is the method of choice. J. A. NUTTER

Some Problems of Gastric and Duodenal Ulcer. Moynihan, Sir Berkeley. *Brit. Med. Jour.*, Feb., 1923.

The author reviewed a series of 718 cases of chronic ulcer of duodenum and stomach taken from the records of the Leeds General Infirmary, The diagnosis of duodenal ulcer can be made with a considerable degree of confidence, but not so a gastric ulcer. Many conditions having their origin elsewhere, are expressed in terms of gastric discomfort. Probably the greatest help to a definite diagnosis is found in the radiological examination. Sir Berkeley Moynihan has discarded the Ewald test meal and substituted the fractional method of Rehfuss. Using this procedure he found only twenty per cent. of the cases of gastric ulcer showing a hyperchlorhydria whereas the percentage of duodenal cases was 72.7. Judged by results he considers medical treatment to have failed in its essential aim, namely, the permanent healing of the ulcer.

In the series he reviews, the average duration of symptoms was seven years to nine and a half years, during which time the patients suffered from several "attacks." Medical treatment gives us no information as to the associated and possibly—causal infections present within the abdomen. In this series the appendix was removed 307 times and the gall bladder 23 times. It seems quite impossible to prevent recurrence of symptoms in a large number of cases. In the recurrent attacks any of the catastrophes such as hæmorrhage or perforation may occur with a fatal result. It is usually in the chronic type of ulcer that these complications do arise. Carcinomatous degeneration at the edge of a simple gastric ulcer must not be neglected. This condition was found in 18.5% of the supposed chronic ulcers. Medical treatment, scrupulously carried out, will, however, rapidly cause an alteration in the gravity of the symptoms within a few days or weeks. Symptoms disappear as soon as an ulcer shows any evidence of healing. That healing does occur occasionally is shown by the discovery of sound, firm scars in the post mortem room. To obtain any permanent result a patient would necessarily have to be kept in bed for many weeks on a very restricted diet.

As a sure and safe procedure he recommends partial gastrectomy. In his hands, in the last ten years, the mortality was only 1.6%. There are a few cases in which it cannot be performed. In these cases he follows Balfour's method of cauterizing the ulcer, followed by a gastroenterostomy. GEO. A. FLEET

Fracture of the Head of the Femur, with Dislocation on the Dorsum of the Ilium. Hinsdale, Guy. *Jour. A.M.A.*, Feb. 17, 1923, p. 469.

This case is reported on account of the rarity of fracture of the femoral head. A woman of 55, weight 160 lbs., fell, striking her hip in "an extreme position of the limb." After the accident, the deformity typical of dorsal dislocation of the hip was present, with about three inches of shortening. Efforts to reduce the hip by manipulation proved ineffectual. X-rays showed one-third of the head of the femur, including, it was found later, the insertion of the ligamentum teres, lying on the lower acetabular margin. The dislocation was reduced by open incision, the fragment first being removed. Recovery was prompt and satisfactory. The author discusses the possible mechanics of the fracture-dislocation, considering it likely that the leg was at first forced into an abnormal position and then, by a fall, the head was broken against the acetabular brim, permitting full dislocation.

J. A. NUTTER

ANAESTHESIA

Nitrous Oxide Anaesthesia in Obstetrics.

Le Protoxide d'Azote Anesthesique Obstetrical). Brault, P., and Barbidor, L. *Le Progrès Médical*, Sept. 2, 1922.

Much publicity has been given, in France, to two recent cases of acute pulmonary oedema, following the administration of nitrous oxide gas. In both these cases the gas was mixed with 25% of carbon dioxide, and with ether, so that there is no reason for incriminating the gas.

The only cause of a fatal accident in gas anaesthesia is asphyxia. Nitrous oxide causes no changes in the blood, either chemically or histologically. It is eliminated in five minutes after the longest administration. Ether takes four and chloroform seven hours to disappear completely.

Nitrous oxide does not decrease the alkalinity of the blood, it increases the coagulability, it moderately increases blood pressure and vomiting is rarely caused. In connection with vomiting after ether or chloroform, this may be due to the property which these two anaesthetics have of lessening the secretion of the adrenals. With this fact in mind, Delbet gives his operation cases hypodermic injections of adrenalin. After anaesthesia with nitrous oxide, when there has been no limitation of oxygen the output of urea is increased.

Nitrous oxide may slightly aggravate the condition of kidneys already diseased, but it never causes damage to them when healthy. Both chloroform and ether produce hepatic insufficiency. Even after ether anaesthesia, bile salts and pigments are found in the urine in many cases; according to Nogue, in eighty-five per cent. of cases. Nitrous oxide causes increased frequency and duration of the labour pains. The second stage is lessened by seventy-five per cent. to eighty-five per cent. under continuous administration; and the whole labour by twenty-five per cent. The patient's mental condition is favourably affected by the relief of pain. The condition after delivery is more satisfactory than when ether or chloroform have been used. There is no reason to believe that there is any more hæmorrhage after labour, or that any harm is done to the child. Nitrous oxide given without sufficient oxygen does not seem to have any effect in causing premature respirations on the part of the child. The only contraindication is high blood pressure. When, however, this is associated with eclampsia, if an anaesthetic is necessary, less harm is done by nitrous oxide than by either ether or chloroform. Some patients, usually alcoholics or very neurotic women, inhale nitrous oxide without any tendency to go to sleep, and must be given ether or chloroform. To obtain relaxation of the abdominal muscles it is important to commence the administration with plenty of oxygen and to keep the patient a good colour.

The only danger with pure gas is asphyxia when the administration is in inexperienced hands. Certain pulmonary after-effects which have followed its use and been attributed to it have been due to the presence of impurities.

Conclusions

1.—Chemically pure nitrous oxide gas given by a competent anaesthetist is harmless to mother and child.

2.—Far from slowing uterine contractions, it appears to lessen by 25% the duration of labour.

3.—Voluntary efforts in the second stage are stronger, because pain is suppressed and the mind calmed.

4.—Nearly all obstetrical operations can be done under gas. Only in exceptional cases is it necessary to add another anaesthetic.

W. B. Howell

Indications for Spinal Analgesia,

(Indications de la Rachianesthesia). Gosset, Prof. A., and Monod, Robert. *Paris Médical*, March 11, 1922.

At the surgical clinic of the Salpêtrière during 1921, 442 operations were performed under spinal anaesthesia, 300 under ether, 3 under chloroform, 9 under ethyl chloride, and 4 under nitrous oxide gas; 75 were done under local or regional and one under splanchic anaesthesia. At first, the writers used a solution of stovaine (Billon) but later abandoned it for syncaine, which is much less toxic. The spinal method long reserved for operations below the level of the umbilicus, can profitably be used for operations on the upper abdomen. They used it in most of their operations on the liver and stomach. They consider it the method of choice in gynaecological operations, in hæmorrhoids, nephrectomy, prostatectomy, for all prolonged operations below the level of the umbilicus and for those entailing much shock such as cancer of the rectum and extensive resections of the bowel. They found it worked well in old patients whose kidneys and livers function badly and who are susceptible to congestion of the lung. They have not used it much in children. In cases of severe trauma, where there is a condition of shock, they think the advantages of spinal anaesthesia open to doubt, as it causes a further lowering of blood pressure. Among their cases were several of acute general peritonitis in which the method failed. They ascribe these failures to the severity of the peripheral nerve excitation which rendered the cord refractory to the action of the anaesthetic. For operations above the level of the umbilicus they used a modified Filliatre's method. They never tried to get anaesthesia higher than the thorax for fear of affecting the bulbar centres.

The risk of post-anaesthesia complications is reduced with spinal anesthesia, notably those associated with defects of the heart, liver and kidneys. Pulmonary complications, so serious in stomach cases, are less often seen. There is less chance of infection from improperly cleaned anaesthetic masks, and there is no hypersecretion from the mouth to be inhaled. Shock is prevented. The complete muscular relaxation prevents straining. The method is not dangerous. Among 2,000 cases the writers saw, no deaths were imputed to it.

After-effects, such as vomiting and retention of urine, they found were never persistent, though headache was occasionally annoying and persistent. Syphilitics seemed specially prone to headache.

Failures and post-anaesthetic complications became less frequent as they became more familiar with the method.

Precision and dexterity are required in making the injection and fresh solutions must be used. In the course of the summer of 1921, which was particularly hot, there were several cases with toxic symptoms (epileptic cases, vertigo, delirium and anuria) from defects in the solutions. Decomposition may result in incomplete anaesthesia. Serious symptoms due to the effect on the bulbar centres, when high anaesthesia had been used, were rare and never followed by death. There was one case of failure of respiration. Artificial respiration and the injection of caffeine tided the patient over the crisis.

Nervous sequelae, such as pain in the back, paralysis of the 6th nerve (there were three of the latter in 1,000 cases) never persisted. Paraplegia they never saw. Injury to the spinal cord is impossible with low spinal puncture. Any local toxic effect of the anaesthetic must always be transitory. The substance injected is excreted in the urine, the elimination being complete in six hours. Many distant nervous effects ascribed to spinal anaesthesia have been shown to be due to syphilis of the nervous system. The objections to spinal anaesthsia are that it occasionally fails, that it requires of the patient calmness and confidence, difficult to obtain in those with nervous temperament and that it sometimes causes headache.

In the case of failure in operations above the level of the umbilicus they advise against continuing the operation, having seen two cases of death with ether under those conditions. They were cases of stenosis of the pylorus due to neoplasms where the stomach was greatly distended. Probably the reflexes of the upper respiratory tract were dulled, for both died from asphyxia due to inundation of the lungs during vomiting. They do not agree with those who advise against repeated spinal injections. In one case they gave six spinal injections within two months. They consider the spinal method of inducing anaesthesia a very valuable one and believe that it should be more generally used than it is.

W. B. Howell

Synergistic Analgesia in Rectal Operations.

Saphir, J. T. *New York Med. Journ. and Med. Record*, March 21, 1923, p. 351.

The writer advocates the use of synergistic analgesia where local or general anaesthesia is contraindicated. He gives three hypodermic injections, each containing morphia gr. $\frac{1}{8}$ dissolved in 10 c.c. of a 25% solution of chemically pure and sterilized magnesium sulphate, at 25 minute intervals, the last half an hour before operation. His patients are free from pain during operation, and from post-operative pain for from 12 to 20 hours. In abdominal cases the use in this way of magnesium sulphate, leads to better relaxation. There is less nausea and pain afterwards. The use of the catheter after operation is less often necessary. Details of six cases are given. In one, local anaesthesia, and in another, nitrous oxide and oxygen had to be used in addition.

W. B. Howell

Nitrous Oxide and Oxygen—Its Value as a General Anaesthetic in Genito-Urinary Surgery. Buettner, J. J. *New York State Journal of Medicine*, March, 1923, p. 112.

The urologist is confronted by extra hazardous risks. Nitrous oxide and oxygen, properly given, exert a less deleterious effect on the body than any other general anaesthetic. They do not irritate the lungs or kidneys. They cause no chemical or morphological changes in the blood. They can be given in cases of high arterial tension with safety. To obtain relaxation a small amount of ether (1-4 drachms) must be added in some cases. The surgeon should be willing to co-operate to the fullest extent with the anaesthetist. R. Fitz, of Rochester, Minn., is quoted as stating that nitrous oxide seems in diabetic cases to reduce acetonaemia. Buettner emphasizes the importance of choosing the proper anaesthetic for each case. Some surgeons state that they have better post-operative results with gas and oxygen than with local anaesthesia. The necessity for a proper preparation of the patient is emphasized. W. B. HOWELL

The Physiologic Effects of Ethylene.—The toxicity of ethylene for flowering plants suggested to A. B. Luckhardt and J. B. Carter, Chicago, the possibility that some of the toxic properties of ordinary illuminating gas for animals might be due to its ethylene rather than to its carbon monoxid content. Experiments were made on animals and on man. From the animal experiments it appears that all of the animals used (mice, rats, rabbits, guinea-pigs and kittens) could be anaesthetized with a ninety per cent. ethylene mixture in one-half the time necessary to anaesthetize the same animals with the same percentage of nitrous oxid. Twelve subjects were anaesthetized, more or less deeply. One of the authors was anaesthetized six times in three days in three weeks; the other (J. B. C.), seven times on the three days in three weeks. In neither instance did sugar or albumin appear in the urine as a result of the experiences, nor did they experience any other evil after-effects except for a slight nausea and loss of appetite, both of very temporary nature. It is evident, then, that deep surgical anaesthesia can be rapidly reduced by ethylene without any sense of asphyxia, but, on the contrary, with a sense of well-being and comfort. Analgesia comes on easily apparently long before complete surgical anaesthesia is established. At a time when there is complete muscular flaccidity, the pulse rate is slightly decreased, if changed at all; respirations are slow but regular, and the countenance normal in colour for the individual, or slightly paler. No cyanosis was ever observed. No subject ever showed any sign even suggestive of asphyxia. The induction of anesthesia was in no way unpleasant except possibly for the first few inhalations of the *concentrated* gas, which induced reflex swallowing. A period of excitement characterized by laughing or forced movement preceded the anaesthesia in some. In others, such signs were absent during induction, but were in evidence as the person recovered from the anaesthesia. Recovery from the anaesthesia was always rapid on withdrawal of the gas mixture. In all, slight weakness and a sense of fatigue were experienced if the person arose from the couch almost immediately on waking up. Vomiting occurred in one early during recovery. In some, slight epigastric distress was experienced temporarily. In others, a slight nausea persisted for several hours after the administration of the gas. In none was nausea so pronounced or so prolonged as to interfere with the ingestion of the next meal. The possible advantages of ethylene over nitrous oxid, if used for human anaesthesia, are: 1. Anaesthesia may human anaesthesia are: 1. Anaesthesia may be maintained: (a) in the absence of all signs of asphyxia; (b) in the absence of effects on blood pressure; (c) in the absence of dyspnea; (d) with complete muscular relaxation. 2. It may be used in obstetrics, a state of complete analgesia being possible at a concentration of eighty per cent. ethylene. 3. There is rapid recovery after long continued administration, without evidence of after-effects. These advantages would make possible its use in many persons and conditions in which nitrous oxid is specifically contraindicated, as in children, in diabetic patients, in old age, in advanced arteriosclerosis, in high cerebral pressure, in operations on the brain, in major operations, and in obstetrics.—*Jour. Am. Med. Assoc.*, March 17, 1923.

News Items

GENERAL NEWS

The Second Congress of French-speaking Dermatologists and Syphilographers will be held at Strasbourg on the 25th, 26th and 27th of July, 1923, as part of the Pasteur Centenary Exhibition, which is being held at Strasbourg from June to October, 1923. This Congress will be under the patronage of the French Society of Dermatology and Syphilology and of the committee of organization of the Association of French-speaking Dermatologists and Syphilographers. Those who are eligible for membership are: (a) The members of National Societies of Dermatology and Syphilology; (b) Physicians who are interested in the question of skin and syphilis, and who are acceptable to the committee of organization. The meetings will be held at the Institute of Hygiene and Bacteriology and at the skin clinic from 9 a.m. to 2 p.m. Cases will be presented, papers will be read and discussions of reports on the following questions will be held: 1. Sensitization and desensitization in skin diseases; reported by Dr. Ravaut, of Paris, and Professor Spillman, of Nancy. 2. Naevo-carcinomata; reported by Professor Masson, of Strasbourg, and Professor Bruno Bloch, of Zurich. 3. Treatment of Syphilis in the pregeneralization period; reported by Dr. Quevrat, of Paris, and Professor Malvoz, of Liège. 4. The value of the different routes in the treatment of Syphilis; reported by Dr. Milian, of Paris, and Dr. Bodin, of Rennes. The president of the committee of organization is Professor Pautrier, 2, St. Nicolas quai, Strasbourg. The Congress of Dermatology and Syphilology will be preceded by the Cancer Congress, which will take place Monday and Tuesday, the 23rd and 24th of July, and will be followed by a Conference on Leprosy, on Saturday, the 28th, Monday, the 30th and Tuesday, the 31st. Further information concerning this congress may be had from Dr. Gustave Archambault, 616, Rue St-Denis, Montreal, Que.

The Medical Alumnae, Toronto, at their annual meeting, April 18th, passed a resolution approving of the plans of Dr. Margaret S. Wallace, late vice-principal of the Women's Christian Medical College, Ludhiana, Punjab, India, to return to India to organize the Indian women medical graduates into an association and to build a home in the Lower Hills that will become the centre of their various activities. The Medical Alumnae appointed a committee to assist in raising the necessary funds. It is hoped that other medical associations will assist in this work. Dr. D. F. Gibb Wishart, 47 Grosvenor St., Toronto, will act as Honourary Treasurer.

Dr. L. Duncan Bulkley proposes to form an American Society for the Scientific Study of the Medical Aspects and the Treatment of Cancer. As there will be a large gathering of the profession at the Meeting of the American Medical Association in San Francisco, he regards that occasion as a suitable one for the consideration of the matter. The plans and the details for such an Association will be worked out in the Meeting which will be called by Dr. Bulkley and of which due notice will be given.

Dr. M. T. MacEachern has tendered his resignation as general superintendent of the Vancouver General Hospital to take effect at once. A special meeting of the board of directors was held on Monday to deal with the matter. He has received a flattering offer from across the border. Last April, the board granted Dr. MacEachern a year's leave of absence to make a Dominion-wide survey of nursing and hospital conditions for the Victorian Order. During the intervening period, he was elected president of the American Hospital Association. His genius as an organizer has attracted widespread attention during the past few years, and his work for the Victorian Order has called forth the most enthusiastic comment in the East. His decision not to return to the Hospital will be much regretted by his many friends in Vancouver.

NEW BRUNSWICK

Dr. J. F. London, McGill '08, who has been in practice in St. John during the past four years, died recently in the General Public Hospital. Sincere sympathy is felt for his bereaved wife and children.

The Annual Report of the St. John County Hospital is just at hand, and proves a revelation to those who have not been familiar with the work done there. Under Dr. H. A. Farris the institution has become one of the most efficient and best equipped in Canada. The addition of an operating room where surgery of the thorax may be done, is a much needed improvement and was the one thing needed to bring the hospital thoroughly up-to-date.

It was with great regret that the profession learned that Dr. Stewart Skinner, for many years Registrar for New Brunswick, had found it necessary, on account of his health, to resign. Fortunately, his successor, Dr. J. S. Bentley, has the goodwill of all the physicians in the province, and will prove a worthy official. His position is not a sinecure, but his popularity with his professional brethren will make the work less irksome than it otherwise would be.

Before this appears in print, the annual meeting of the New Brunswick Medical Society will have been held. It is hoped that at it some steps will be taken to establish sectional medical societies that will be branches of the provincial society and through it affiliated with the Canadian Medical Association. Conditions in New Brunswick are somewhat different from those in other places, but all difficulties must be overcome and the professsion organized if we are to become such a power in health matters as we should be. People look to us for information and instruction in these things, but we can only have the proper influence if we are organized. The public welfare, as well as our own interests, demands it and any effort to bring about such a necessary organization will be worthy of the support of all those who have at heart the health and best interests of the public.

The second meeting of the Maritime branch of the American College of Surgeons was held in St. John, May 11-12. The clinics, scientific sessions and public meetings were well attended and proved of great interest. Drs. Craig and MacEachern—associated directors of the college—were present and took advantage of every opportunity to give publicity to the college and its work. Insofar as this affected the betterment of our hospitals it was of interest to the general public and the profession at large. In St. John, we have noted the improvements that have come about in both our hospitals as a result of standardization which was sponsored by the college. In this work it should have the undivided support of the public and the medical fraternity. The local fellows of the college arranged a very interesting programme and were not amiss in looking after the entertainment of their visitors. Those attending the clinics were the guests of the Commissioners of the General Public Hospital at lunch on Friday, and on Saturday the Military Hospital proved a most efficient host. Amongst the out-of-town fellows present were, Drs. Pinault, of Campbellton; Vanwart, of Fredericton and Rankine, of Woodstock.

Enquiries from different parts of the province regarding the possibility of getting a supply of Insulin to use in diabetic cases, necessitates the informing of New Brunswick practitioners, through the *Journal*, of the present status of Insulin treatment in New Brunswick.

The general practitioner to whom literature is not yet available, should know that Insulin is not a substitute for present methods of treating diabetes. It should never be used if diet, etc., will allow the patient to get along comfortably. It is in cases that are going bad in spite of treatment, and particularly in diabetic acidosis and coma, that Insulin is indicated, and in these it is almost a specific when administered under favourable conditions.

Some time ago the committee that controls its use and distribution, decided to allot some for experimental use in the General Public Hospital, St. John. This supply was placed in charge of Dr. W. E. Rowley, and the results obtained have been extremely satisfactory and compare favourably with those obtained elsewhere. Worthy of note was a case of diabetic gangrene in which after treatment, an amputation was performed and healing took place by first intention.

The dosage in each case must be determined experimentally, and every change in dosage and in diet must be guided and controlled by a simultaneous estimation of blood sugar. Without this laboratory work the administration of Insulin is not without danger as Insulin will reduce sugar even if the sugar is not present in excess or in the diet. After discharge from hospital, the patient, even if he can get along without further treatment, and particularly if Insulin is still being used, should have frequent blood sugar estimations made, as variations in diet, as well as emotional or other outbreaks, may disturb the established equilibrium and produce a crisis. The administration of the drug must be checked step by step by accurate estimation of blood sugar, and must be given in conjunction with a carefully weighed and definite diet. For these reasons it is not, at present, deemed advisable to issue the remedy for use elsewhere than where blood sugar estimations can be made. As the laboratory attached to the General Public Hospital is the only one east of Montreal that is equipped to do the delicate and accurate tests required to guide the administration and dosage of this new and potent remedy, there seems no possibility, at present, of any being available for use outside St. John.

The Insulin committee of the University of Toronto have instituted a two days' course at the Toronto General Hospital to instruct physicians in, (a) the method of administration, (b) the choosing of suitable cases and, (c) to become familiar with the untoward effects of overdosage and the treatment of these effects. Later on, physicians who have taken this course will be offered, at cost, a limited supply of Insulin for use in cases under their charge. Any physicians desirous of taking this course are requested to write to the Secretary of the New Brunswick Medical Society. The cost of treatment varies from $2 to $3 for the Insulin *plus* hospital, laboratory and physicians' fees. E. J. R

QUEBEC

MASONIC INSTITUTE FOR CRIPPLED CHILDREN TO BE READY IN A YEAR

Through the generosity of local Shriners, a hospital for crippled children whose parents cannot pay for treatments will be in operation within one year in Montreal. It will contain 50 beds and will be situated next to the Children's Memorial Hospital on Cedar Avenue. The building is estimated to cost $250,000.

Dr. J. A. Mireault gave an interesting lecture on "Industrial Medicine" at the Chambre de Commerce in Montreal recently.

Dr. L. Reford returned recently from a trip to the Orient.

Dr. A. Lorne C. Gilday has been made superintendent of the Western General Hospital.

Announcement is made by the Laurentide Health service that Dr. Harry R. Hooper, of Montreal, is to be examining physician, succeeding Dr. Turney. Dr. Hooper will not take up work at Grand'Mere until the summer.

The Hon. Dr. Henri S. Beland was the guest of honour at a farewell banquet given in the Rose Room of the Windsor Hotel by the fifth year students of the University of Montreal, recently.

Dr. Frank E. Pedley, candidate for a degree in the Harvard University School of Public Health, is at present serving as an examining physician for the Laurentide Health Service. He is a graduate of McGill in Medicine, and while still an undergraduate served with distinction in hospitals overseas.

Dr. Alderic Lesage, a prominent physician at Pointe Claire, P.Q., where he has resided for the past twenty-seven years, died recently after a long illness. He had served as Mayor of the city for the term of two years, and for many years had acted as President of the local board of School Examiners.

Dr. Mary Runnells Bird, a graduate of Bishops College, and holding an *adeundum* degree from McGill University has returned to Montreal, where she intends to practice. She did good work in England during the four years of the War and more recently acted as Director of Maternity and Child Welfare in the city of Derby,

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Dr. Wilfred Lord, of Granby, sailed recently on the S.S. *Empress of Britain*, and purposes to spend a year in Paris, devoting special attention to the study of electrical treatment and surgery.

Dr. Harwood, dean of the Faculty of Medicine of the University of Montreal, and the dean of the Faculty of Medicine of the University of Laval, have been appointed delegates to represent the Governments of Quebec and Ottawa as well as their respective Universitites at the convention at Strasbourg, the end of June.

The *Montreal Dispensary* held its 73rd Annual Meeting recently, at its rooms on St. Antoine Street. During the year ending April 30th, 1923, the dispensary has treated 11,000 sick patients unable to pay for medical attention. Efforts are now being made to employ a regular social service worker to look after the family welfare of some of the more needy of the patients.

The *epidemic of typhoid fever in Mansonville, P.Q.* is definitely on the decline. Most of the cases who are being treated at their own homes, are now in the convalescent stage, and those who are in hospital are reported by the physicians in attendance as well on the road to recovery. The town's sanitation system has been carefully examined, and many improvements will be made, following instructions from the Provincial Board of Health.

The Provincial Government is making arrangements to take over from the Federal Government the *control of the Ste. Agathe Sanatorium* and details concerning the transfer were discussed recently by the representatives of the two administrations. At present, the institute is occupied by invalided soldiers, and it is announced that the province will not definitely take over the hospital until the present inmates have left.

Dr. Herbert William Turney, examining physician for the Laurentide Health Service, died February 21st, at Grand'Mere, P.Q. Death was due to heart failure following a severe attack of pneumonia. Dr. Turney was born in Ontario, graduated in Arts from the University of Toronto in 1914 and in 1917 obtained his doctorate in medicine from McGill. He served for two years as resident *interne* at the Royal Victoria Hospital in Montreal, and then took up work with a Life Extension Institute in New York. Shortly afterwards, he accepted a position in connection with their work in Grand'Mere. In 1920, he married Miss Muriel Black, of St. Johns. His wife and young daughter, as well as both his parents and a brother, survive Dr. Turney.

Dr. E. N. Chevalier, of Iberville, who graduated in 1873, celebrated his fiftieth anniversary in the practice of medicine last March. During his long and successful practice he has made many friends. For many years he has been coroner of the district. Some years ago he was made a Surgeon Major in the Canadian Army Medical Corps, and acted as the Medical Officer in charge of the barracks when the Royal Canadian Rifles were stationed there, and was deservedly popular with both officers and men. He is still in practice and is at present connected with the St. Johns General Hospital.

ONTARIO

PRESENTATION TO DR. McCULLOUGH, CHIEF OFFICER OF HEALTH FOR THE PROVINCE OF ONTARIO

An address of appreciation to Dr. McCullough by members of the Provincial Board of Health took place on April 23rd, 1923, in which they emphasized with pride the rapid strides which had been made in public health work in the province during his long tenure of office. Many of the most healthful enactments in public health legislation had been placed on the statute book either on his personal advice or as the result of research work carried out under his direction.

They desired to recognize that the unparalleled success which had attended the efforts of the Board throughout the province had been made possible owing to the support afforded by Dr. McCullough. The excellent results attained in the control of communicable diseases particularly in relation to typhoid fever, diphtheria, small-pox and venereal disease are worthy of the highest possible commendation. Along with this very complimentary address his *confreres* presented him with a handsome English club bag as a token of their affection and esteem, and expressed the hope that he might long be spared to continue the work which had been of such service to the community.

The address was signed by the following: A. H. Wright, James Roberts, T. E. Kaiser, W. H. Howey, H. R. Casgrain, A. S. McElroy.

MEDICAL LEGISLATION

The Legislative Assembly of the Province of Ontario passed the third reading of the Medical Bill on Friday, May 4th, 1923. Although the Bill, which is herewith appended, does not compel the present irregulars in the province to cease practising, it does aim to accomplish three great things, namely, (1) defining the "Practice of Medicine"; (2) demanding that, in the future, all who desire to practice in this province must be educated; (3) placing prosecutions where they belong, namely, in the hands of the County Crown Attorneys. There is much cause for gratification on the part of the medical profession of the province.

MEDICAL BILL

An Act to amend the Ontario Medical Act

His Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:

1.—This Act may be cited as The Medical Act, 1923.

2.—The Ontario Medical Act is amended by adding thereto the following sections:

47a.—Every person shall be deemed to practice medicine within the meaning of this Act who holds himself out as being able to diagnose, treat, operate or prescribe for any human disease, pain, injury, disability or physical condition or who shall either offer or undertake by any means or method to diagnose, treat, operate or prescribe for any human disease, pain, injury, disability or physical condition.

47b.—Nothing in this Act contained shall apply to or affect:

- (a) any commissioned medical officer serving in the army, navy, or marine hospital service;
- (b) any lawfully qualified physician in any other province or country meeting a legally qualified medical practitioner in Ontario in consultation;
- (c) any person actually serving without professional fees on the resident medical staff of any legally incorporated hospital in Ontario;
- (d) the furnishing of first-aid or temporary assistance in cases of emergency;
- (e) the domestic administration of family remedies;
- (f) persons treating human ailments by prayer or spiritual means as an enjoyment or exercise of religious freedom;
- (g) the practice of chiropody;

47c.—Nothing in this Act shall apply to or affect:

- (a) the practice of dentistry by a dentist duly licensed under *The Dentistry Act* to practise dentistry in Ontario;
- (b) any person who manufactures or mechanically fits or sells artificial limbs or other appliances;

(c) the practice of optometry by an optometrist duly licensed under *The Optometry Act* to practise optometry in Ontario.

47*d*.—(1) A person not being a legally qualified medical practitioner who was on the 1st day of January, 1923, practising in Ontario as an osteopath, chiropractor, or drugless healer and who within sixty days after the coming into force of this section files in the office of the Provincial Secretary a statement in the form to be furnished by the Provincial Secretary, stating; (a) his name in full; (b) his place of residence; (c) his degree or certificate of qualification or other document under which he claims to be qualified to practice; (d) evidence as to his character and good behaviour, and (f) the particular method which he is practising, shall not incur any penalty under this Act for the practice of medicine under this Act so long as he continues to practice according to the method named by him in such statement.

(2) There shall be kept in the Department of the Provincial Secretary a list of all persons who have filed statements as required by subsection 1, classified according to the several methods of practice named by them.

47*e*.—The Lieutenant-Governor in Council may make regulations providing for the admission to the practice of medicine of persons professing any system of healing and prescribing the qualifications to be required of such persons.

3.—Subsection 2 of section 58 of *The Ontario Medical Act* is repealed and the following substituted therefor:

(2) Every prosecution under this Act shall be undertaken and conducted by the Crown Attorney of the county or district in which the alleged offence was committed, whose duty it shall be to see to the enforcement of the provisions of this Act.

4.—This Act shall come into force and take effect on the 1st day of July, 1923.

INSULIN

In response to a request from the Medical Faculty of the University of Toronto, the Ontario Medical Association circularized the entire medical profession in the province, stating that two day clinics would be held at the Toronto General Hospital for the convenience of practitioners who desired to make an intimate study of the use of insulin, and the concomitant treatment for diabetes mellitus. Over 600 applications for attendance at the clinics have been received. Eighty of these have already attended and it is hoped by the Medical Faculty to complete the clinics during the early part of the summer. Reports from physicians who have attended speak very enthusiastically of the work.

Mr. H. M. Lancaster, B.A.Sc., Director of Laboratories in the Provincial Board of Health, was honoured on May 14th by the presentation on behalf of the staff with a beautiful reading lamp. Mr. Lancaster is taking charge of the Division of Food and Drugs of the Federal Department of Health, Ottawa, and leaves the Board after twelve years' service and with the best wishes of the Board and staff. Dr. Charles M. Anderson, C.P.H., the former Provincial Bacteriologist, has been appointed to succeed Mr. Lancaster as Director of Laboratories.

Because of local conditions requiring a renewed stimulus of interest in the Sick Children's Hospital, recently opened in London, Sir Robert Jones, distinguished visitor to the Canadian Medical Association, has very kindly consented to come to London and inspect the hospital, conduct a clinic and otherwise assist the furtherance of the project of the care of sick and crippled children of Western Ontario. The day of the meeting is tentatively fixed as June 14th.

The Western Ontario Academy of Medicine held its final general session for the term of 1922-23 on May 25th, with a considerable attendance of doctors from Western Ontario points. The programme was furnished by Dr. Wm. Goldie, of Toronto, speaking on the subject of Hypertension; Dr. Hugh Cabot, of Ann Arbour, Michigan, delivering an address on the management of small Urenal and Urethral Calculi, illustrated by lantern and X-ray pictures; Dr. Thos. Morgan, of New York, contributed the third number as the exposition of the anatomy of the pelvic floor in relation to Gynaecology and Obstetrics, also showing, by means of a moving picture, the technique of an operation for Perineorrhaphy.

BRITISH COLUMBIA

VICTORIA MEDICAL ASSOCIATION

Dr. J. W. Warren, of Calgary, has been appointed Director of the Department of Radiology at the Provincial Royal Jubilee Hospital, Victoria, B.C. Dr. Warren will take over his new post on May 15th. Since 1919, Dr. Warren has been Radiologist to Calgary General Hospital and leaves that institution to move to Victoria. He was born in Perth, Ontario, in 1882. He graduated from Queen's University in 1905, and was for eleven years engaged in general practice in North Dakota. Since then he has been engaged in Radiology. In 1916, Dr. Warren left with the C.A.M.C. to serve with Canada's overseas forces, and working under Major Pirie at Moore Barracks Hospital, Shorncliffe. From 1917 to 1919 he served as Radiologist at No. 7 Canadian General Hospital at Etaples. After returning to Canada, Dr. Warren became Radiologist at College Street Military Hospital,in Toronto, until he was demobilized in September, 1919, when he moved to Calgary General Hospital.

VANCOUVER MEDICAL ASSOCIATION

The Twenty-Fourth Annual Meeting of the Association was held in the Board of Trade Rooms, Vancouver, on the 17th of April. Dr. F. J. Buller was elected President for the ensuing year, Dr. H. H. Milburn, Vice-President, and Dr. J. A. Sutherland was elected Secretary. Dr. Stanley Paulin was re-elected Treasurer.

The various Standing Committees of the Association presented their reports showing a successful year's work. Dr. Pearson, Chairman of the Summer School of the Association announced the plans for the Session which will be held this year from July 3rd to 6th inclusive. The Lecturers will be, Dr. H. A. Christian, of Harvard University Medical School, Dr. Andrew Hunter, Professor of Biochemistry, Toronto University and Dr. Carl B. Davis, of Chicago. Four addresses will be given by each Lecturer, and a large attendance is expected. The Committee appointed to enquire into the feasibility of establishing a Medical Service Bureau along lines similar to those established in other large medical centres reported satisfactory progress.

The Association is standing solidly behind the British Columbia Medical Association in its efforts to improve the conditions of contract practice in the province, and has every confidence that the fight now being fought with the Railway Organizations will be brought to a successful conclusion.

At the April meeting of the Victoria Medical Society, Dr. Alison Cumming, of Vancouver, read a paper on "Diabetes," and told of the Insulin treatment carried out in that city.

Dr. R. E. McKechnie, of Vancouver, read a paper at the May meeting of the Victoria Medical Society on "Some Aspects of Bladder Surgery."

Dr. H. A. Whillans, who has been in general practice in Victoria, B.C., for several years, has moved to Stewart, B.C.

Dr. A. L. Jones, late of Victoria, B.C., is now in Revelstoke, B.C., engaged in general practice.

Dr. H. B. Rogers has moved from Victoria to Chemainus, B.C., where he is engaged in general practice.

The Annual General Meeting of the Okanagan No. 4 District Medical Society will be held at Penticton, on June 1st, 1923. A record attendance is expected.

The Executive Secretary of the British Columbia Medical Association recently visited Vancouver Island, and had a personal interview with practically every medical man. Their interest in the activities of the Association, their appreciation of the efforts of its committees to improve economic conditions and particularly of the solidarity of the profession speaks well for the future of the Association.

Dr. C. H. Vrooman has resigned his position as physician in charge of the Rotary Clinic for Diseases of the Chest, of Vancouver. His resignation is due to a very definite change in the policy of the Clinic inasmuch as formerly only indigent or such other cases as were referred in consultation by medical men were examined and treated, now it is the intention to make the clinic free for everyone in the fullest acceptation of the term. This occasions a full time medical officer who will not undertake any private practice. In the opinion of a number of medical men it is not a desirable change, as the clinic will be exploited by people who are quite able to employ a physician privately. As Dr. Vrooman disapproves of this policy he has been compelled to sever his connection with the clinic and will devote himself to private practice. He will remain in charge, however until his successor is appointed.

Dr. Edward S. Hasell, who has been Medical Superintendent of the Provincial Royal Jubilee Hospital, Victoria, B.C., for twenty-six years died on March 13th, 1923, in his 64th year. He was one of the senior members of the profession in Victoria, having begun practice thirty-five years ago. He was a member of the British Columbia Medical Association and an active member of the Victoria Medical Society. Dr. Hasell was highly esteemed by his fellow members and occupied a prominent place in the community. He was born in India in 1859. He received his early schooling at Harrow and graduated from King's College Hospital, London. Apart from his interest in medicine there was perhaps no subject which held Dr. Hasell's attention so closely as Art: his private collection of water-colours, engravings and books of Art is undoubtedly one of the finest in the Western Province: The Island Arts and Crafts Society owes its existence to him and to the interest which he always took in its meetings. He was its president during the greater part of that time. He was also largely responsible for the founding, in 1889, of the Natural History Society of Victoria.

During the last few months the British Columbia Medical Association Executive and Industrial Service Committee have had a strenuous time dealing with the Railway Medical Contracts dispute. It is perhaps difficult for other provinces to realize how pernicious this contract practice is in British Columbia. Railway employees have for years been receiving medical services obtained at the expense of the doctors which would not have been tolerated elsewhere. In asking the C.P.R. Employees' Association for an amelioration of the working conditions by the elimination from contracts of all the medical and surgical work on families and dependents of employees, and requesting that same be paid for on the principle of "payment for services rendered" at a preferred rate comparable with the W.C.B. scale of fees (provided payment is guaranteed by the Railway Association) the profession does not think it is asking for anything unreasonable. Several conferences with the C.P.R. Employees' Committee have, unfortunately, proved abortive; they appear to be adamant in claiming "their pound of flesh" and have resolutely declined the British Columbia Medical Association's offer to submit the whole question to an impartial arbitration board and abide by its decision. In view of the unreasonableness of the C.P.R. Employees' Association in handling this controversy, the Executive of the British Columbia Medical Association has decided to lay the whole facts before President Beatty with a request that the matter be investigated, as it is felt that the C.P. Ry, as a company, would not countenance such exploitation of the medical profession in this province were they cognizant of the whole facts.

EVERY DAY AND EVERY WAY

Oh Mr. Coué comes from France and from the
town of Nancy,
His "every day and every way" caught many
persons' fancy.
His views were put into a book, 'tis found in
many places,
"Imagination rules the will"—its keynote and its
basis.

If fever or a broken bone, or ills that end in -itis,
A toothache, or a haemorrhoid, a wheezy old
bronchitis,
If any such should rack your flesh, till you are
nigh distracted,
Then try the "every day and way" that formula
didactic.

What need for ointments or for pills, for this or
that fine potion?
Away with salts! confound your squills! no more
of any lotion!
And why seek constipation's cure, by lengths of
bowel resected?
When all may learn the "day and way" a lesson
resurrected.

And when the wife in labour pains, for nurse and
doctor hollers,
We'll soothe her mind in Coué's way and save so
many dollars,
He'll be quite pleased to learn about such faithful
loyalties,
But better far to hear about increasing royalties.

The views which Coué has advanced are found in
many pages,
From Charcot back to Plato's time, and in the
Middle Ages,
That well they knew the mind of man can be now
predicated,
But then their views did not bring cash, nor were
they syndicated.

E. J. Mullally

Obituary

Dr. John Wallace Scane. It is with much regret that we have to announce as we go to press, the death on the morning of May 20th, in his fifty-fourth year, of Dr. John Wallace Scane, Secretary-Treasurer of our Association. There are few in the profession to whom his death will not bring a sense of deep personal loss. His personal attractions were many. Those who did not wish him well must have been very few. He has acted as our Secretary-Treasurer for the last eight years and to him the success of our Annual Meetings has been largely owing. We must defer to our next issue a full statement of his many activities, not only in connection with university teaching, but also on behalf of the profession generally. His memory will linger long, both among students and confreres, as an earnest and successful teacher and a true and very congenial friend.

Dr. G. I. Campbell of Grand Valley, died in Fergus Hospital, on April 25th. A graduate of the University of Toronto Medical Faculty in 1897, he had practised in Grand Valley for twenty-five years.

Dr. Harold W. Street of Owen Sound, a graduate of Toronto University Faculty of Medicine in 1918, died in Constantinople from typhus fever in April of this year.

Dr. F. McLaughlin died in Morrisburg on April 18th, where he had practised since 1890. Dr. McLaughlin was a graduate in medicine of Queen's University Medical Faculty in 1886, and after practising in Harrowsmith had moved to Morrisburg.

Dr. George Shannon died in St. Thomas on April 22nd. A graduate of the University of Toronto Medical School in 1890, he first practiced in Sparta, coming later to St. Thomas, where he had lived for fifteen years. Dr. Shannon was at one time president of the St. Thomas Medical Association, and had been one of the city's most prominent general practitioners.

The death of **Dr. J. A. LeBlanc,** aged 69, a well known Montreal physician, occurred at his home, 401 Demontigny Street East, after a short illness. He began the practice of medicine forty-seven years ago, and up to the time of his decease was the physician of several of the religious institutions in the city.

Dr. J. A. Stewart of Montreal, died at Kingston on April 18th. Dr. Stewart had been on the staff of St. Anne de Bellevue Hospital for some years after having served for four years overseas. He was a graduate of Queen's University Medical Faculty.

Dr. Edward Featherstone of Prescott, died in Brockville on April 22nd. Dr. Featherstone was a graduate of Trinity University Medical Faculty in the year 1895, and had an extensive practice in Prescott and the neighbourhood.

Dr. Adam Thompson died in Galt on April 19th. Dr. Thompson had been well known both in medical and political circles, and had practiced in Galt for many years. Dr. Thompson was a graduate of Trinity Medical College in 1887, and Licentiate of the College of Physicians and Surgeons of Ontario, in the same year.

Dr. R. H. MacAulay, passed away at his late residence, Queen Street, Guelph, on April 27th, after a protracted illness. The late Dr. MacAulay was born in the city of Montreal, in 1861, and was the second son of the late Robertson MacAulay, president of the Sun Life Assurance Company, Montreal. Following his early education and subsequent graduation as a medical practitioner, he went to the east as medical examiner for the company in 1897, and remained there for a number of years. On his return he took up his residence in Guelph, where he has since resided. During his residence in Guelph he has taken an active interest in everything that pertained to the interest of his fellow citizens and was a generous supporter of all charitable objects.

Dr. John R. Stone died in the General Hospital at Parry Sound, on April 26th, after a long illness. One of the best known and most progressive of Ontario physicians, Dr. Stone was well known in Parry Sound district where he had practised for many years. For the past thirty years he had taken a leading part in the developing of the General Hospital in Parry Sound, and the efficiency of this institution was largely due to his active interest. An M.B. of the University of Toronto Medical School in 1889, he soon became well known as a surgeon, though never confining himself to the practice of medicine alone. Dr. Stone had been a member of the town council, chairman of the finance committee, and an active worker in Liberal politics. As an able medical adviser and as a real philanthropist, Dr. Stone had always occupied a position of great prominence and his death means a great loss to the community at large.

Book Reviews

Heliotherapy By A. Rollier, M.D. Oxford Medical Publications, Henry Frowde, Hodder and Stoughton.

Heliotherapy is attracting attention from other than medical reviewers; in the London Times Weekly Edition for April 5th, 1923, and in the Literary Supplement of the same issue, there are reviews of the good results obtained in the treatment of surgical tuberculosis by sunlight in Dr. Rollier's clinic at Leysin, in the Alps.

This clinic was established in 1903, and the twenty years which have elapsed since then have more than justified the hopes which actuated the employment of sunlight in the treatment of a condition which has not been benefitted to any great extent by surgical measures. Those of us who have been practising medicine for a decade or more, have not been impressed with the numerous operative procedures, the splints, the fixations, the numerous dressings seen in the treatment of patients with surgical tuberculosis in city hospitals; the results in too many cases have been such as to swell the mortality statistics. Dr. Rollier's results during the past twenty years, in his clinic, in an Alpine village in Switzerland, where the deeply-tanned children are kept out of doors, devoid of clothing, playing games or lying about in the sunlight, are in cheering contrast to those obtained in the average industrially-centred hospital in which the sick children are confined to beds in various forms of fixation apparatus.

Heliotherapy, to use the words of the medical cor-

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2. The food must be well balanced, for a deficiency in one element means the ineffective action of the other food elements.
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respondent writing in the *Times*, "is no mere system of casual sun baths; it is an exact science which has been built up with infinite care and resource. It demands for its practice, knowledge, experience, and patience." The connection between pigmentation of the skin and successful therapy, not only in tuberculosis but in other conditions as well, is one of the interesting observations recorded by Dr. Rollier; in his clinic the exposures are gradual and when, instead of the looked-for stimulation and exhilaration which usually follow a treatment, there is headache and giddiness, the technique of the exposure demands investigation.

As is well known, sunlight treatment has been followed by the employment of artificial light from various types of so-called healing lamps; on this continent the results obtained from this form of therapy at the Saranac Lake clinics have proved very valuable in tuberculosis of the intestine and bones. If sunlight has been employed with distinct benefit both in Switzerland and in Saranac in the treatment of tubercular lesions, there is no reason why it should not be employed elsewhere; old Sol is quite partial to Canada in the distribution of his beneficent rays; in Rollier's clinic it was found that the best results followed from sunbaths given when the air is cool, between 6 a.m. and 9 a.m.; it is not heat that is desired but light, a further encouragement for Canadian practitioners to make use of this natural remedy.

It is not a complimentary commentary upon our present much vaunted civilization and science, that sunlight treatment of diseased conditions—a treatment which must be as old as the human race—should be so little employed nowadays as a therapeutic measure, that encouraging reports from clinics where it has been used are considered as marking an advance in the treatment of disease. E. J. M.

Diseases of the Stomach and upper Alimentary Tract By Anthony Bassler, M.D., F.A.C.P. Fifth edition, revised and enlarged. 8vo., pp. 899. 151 halftone and line text engravings and 93 full-page plates, with 164 figures, plain and in colours, from original photographs and drawings. Price, $8.00. F. A. Davis Company, Philadelphia.

With five editions since 1910, Bassler's work would appear to have made a place for itself as a guide to diagnosis and treatment of disorders and malformations of the oesophagus and stomach. There is a short chapter on diseases of the mouth, but principally in relation to digestive disturbances. Disorders of the salivary secretion receive due attention. The recent advances made in the study of gastric juice, gastric motility and sensation have found a place in this new edition, and much more space is given to X-ray studies. The plates illustrating this method of diagnosis are excellent and should serve to acquaint the physician with the value of roentgenological investigations. The portion of the work devoted to physical methods of treatment is commendable. There is a splendid chapter on indications for surgery. Fifty pages are devoted to splanchnoptosis, a chapter which is worthy of special mention. Laboratory methods of diagnosis described are made more clear by the judicious use of drawings, photographs and coloured plates. The revision has brought the work up to date, making it a valuable text on its special subject. J. H. E.

Abstracts of Current Venereal Disease Literature. Issued by authority of Department of Health, Ottawa.

These abstracts are issued regularly by the Department of Health, Ottawa, and deal with the current literature on venereal disease and its problems; distributed gratuitously to Canadian physicians, they serve a most useful purpose, in stimulating interest in and promoting wider knowledge in those subjects.

A recent special number of this series is devoted to a consideration of the treatment of the syphilitic pregnant woman during her pregnancy. This number is intended for distribution to physicians, hospitals, nurses, and women's organizations, and is designed to be intelligible to the lay reader. Stress is laid upon Dr. Whitridge Williams' studies of 4,547 pregnant women, whose blood had been tested for syphilis during pregnancy, which showed that this disease was the most important single factor in the causation of the death of the child. The results of treatment in preventing child mortality, and in producing healthy children are most satisfactory. The earlier in the pregnancy that ante-natal treatment is commenced, the better the results. Treatment should be intensive, and is followed by no consequences other than good.

Sequira, of Glasgow, recommends, among other points, that the husband and every child of an infected woman should be examined and similarly the parents and every member of the family of a child suffering from congenital syphilis. This is an important duty of the social service workers and those in charge of maternity, pre-natal and venereal clinics. The value of the abstracts might be enhanced to scientific readers, were the references to the publications of the abstracted articles definitely stated.

The abstracts are of great educational value, and of definite service to the community; they should be extensively read. F. S. P.

Blessures et Maladies de Guerre—Diagnostic, Traitement et Expertise des Sequelles Oto-Rhino Laryngologiques. By Dr. Jean Guisez. Paris, J. B. Bailliere & Fils. 1921.

In this small book of some 222 pages the author gives his personal experiences of injuries of the ear, nose, and throat. These are, of course, war injuries, but a large number of them are also liable to occur in industrial areas. Quite a large portion of the book is devoted to plastic repair of the injuries of the face and neck. There is detailed information *re* fitness for military service and estimation of the amount of disability caused by the various injuries. These sections have considerable value for judging the amount of compensation in industrial cases. The book, like many other French text books, is well and clearly written, but does not bring out any new facts. It forms a useful compendium of the specialty as applied to war. J. K. M. D.

Books Received

Merck's Manual of the Materia Medica. Fifth edition. Published by Merch & Co., 45 Park Place, New York, 1923.

Medical History of the Great War, Medical Services, Hygiene of the War—Volumes I and II. Edited by Major Gen. Sir W. G. MacPherson, K.C.M.G., C.B., LL.D.; Colonel Sir W. H. Horrocks, K.C.M.G., C.B., and Major General W. W. O. Beveridge, C.B., C.B.E., D.S.O., K.H.P.

Mistakes and Accidents of Surgery. By Harold Burrows, C.B.E., M.B., B.S., F.R.C.S. 464 pages. Price, 10s. 6d. Published by McClelland & Stewart, Ltd., 215 Victoria Street, Toronto, 1923.

The Emery Medical Review. Wesley Memorial Hospital Number. Vol. 2, No. 1. Published quarterly by the Faculty of the Medical School of Emory University. Subscription, $1.00 per annum.

CHEMOTHERAPY OF SYPHILIS

1° — ARSENICAL CHEMOTHERAPY:

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INDICATION: To be used where an intensive treatment is desirable, in intravenous injections.

DOSAGES: In cartons each containing one sealed glass ampule of 0.15, 0.30, 0.45. 0.60, 0.75, 0.90 grammes.

Also in outfit containing 12 ampules of 0.15 grammes each together with 12 ampules of Solution Stovaine 1% for subcutaneous use.

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A solution, stable and sterilized, of Amino-Arseno-Phenol the basis of 606 and containing 40% of Arsenic.

INDICATION: Used for the treatment of syphilis by intramuscular injection.

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2° — BISMUTH CHEMOTHERAPY:

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An aqueous, glucose and neutralized solution of Tartro-Bismuthate of Sodium and Potassium.

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An oil suspension of Tartro-Bismuthate of Sodium and Potassium.

INDICATION: Bismuth salts have a therapeutic efficiency proven by the rapid disappearance of the treponema from the lesions; specially in those cases which have become arseno or mercuro resistant.

DOSAGES: **LUATOL "A"**—in boxes of 10 ampules of 1 c.c. containing in solution 0.10 grammes per c. c. of tartro-bismuthate of Sodium and Potassium for intramuscular injections.

LUATOL "B" — in boxes of 12 ampules of 4 c. c. containing in oil suspension 0.10 grammes per c. c. of tartro-bismuthate of Sodium and Potassium for intramuscular injections.

RUBYL

An oil suspension of Iodide of Quinine and Bismuth in ampules of 3 c. c.

INDICATION: Iodide of Quinine and Bismuth is one of the best tolerated and most active of the insoluble bismuth salts, having a remarkable action in syphilis of the nervous system.

DOSAGES: Boxes of 12 ampules of 3 c. c. containing 0.10 grammes of active product per c. c.

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A Text Book of the Surgical Dyspepsias By A. J. Walton, M.D., M.B., B.Sc., F.R.C.S. 728 pages, illustrated. Price, 12s. net. Published by Edward Arnold & Co., London, W., 1923.

Nursery Guide for Mothers and Nurses. By Louis W. Sauer, M.A., M.D. 188 pages, illustrated. Price, $1.75. Published by C. V. Mosby Company, St. Louis, U.S.A., 1923.

A Monograph on Gonorrhoea. By A. Reith Fraser, M.D. 503 pages with 56 illustrations and 49 plates. Price, 18s. net. Published by Henry Kimpton, 263 High Holborn, London, W.C., 1923.

The Form and Functions of the Central Nervous System. By Frederick Tilney, M.D., Ph.D. and Henry Alsop Riley, A.M., M.D with foreword by George S. Huntington, Sc.D., M.D. Second edition. 1019 pages, 591 figures, containing 763 illustrations of which 56 are coloured. Price, $12.00. Published by Paul B. Hoeber, New York, 1923.

Environment and Resistance in Tuberculosis By Allen K. Krause, A.M., M.D. A presentation of the nature of environment and resistance and their relation to the pathology, diagnosis, symptoms, and treatment of tuberculosis. 137 pages. Price, $1.60. Published by Williams & Wilkins Company, Baltimore, Md., 1923.

Management of the Female Urinary Bladder After Operation and During Pregnancy.—A study devoted to postoperative care of the urinary bladder, with especial consideration of the part played by residual urine, has been made by Arthur H. Curtis, Chicago, throughout the period of convalescence of 1,595 female patients subjected to serious operations. Use of the catheter has been avoided when possible, but no patient has been allowed to suffer from distention. Residual urine has been present after the return of spontaneous micturition in more than 64 per cent. of all repeatedly catheterized patients The most important principle in our treatment of such cases has been the daily passage of a catheter, immediately after urination, until residual urine is no longer present. Only three of those who were catheterized daily until the return of normal function developed urinary tract infection. These three subsequently showed residual urine after they were thought to have returned to normal, and it is believed that lack of treatment during this time accounts for the infection. Laboratory study of urine from patients subjected to postoperative catheterization reveals that there may be temporary cystitis. This invariably—and usually very promptly—disappears if freedom from residual urine is maintained. Instillation of $\frac{1}{8}$ per cent. silver nitrate and administration of urinary antiseptics by mouth are helpful adjuncts in the treatment. Strict avoidance of the use of the catheter after all operations, despite distress, would perhaps reveal equal freedom from infection; but this plan cannot be followed without much suffering to many patients. Moreover, animal experimentation indicates that if bladders are allowed to distend and overflow, considerable back-pressure destruction of kidney tissue results. Clinical evidence indicates that residual urine occurs very often in pregnant women. The notable frequency with which it is present in those with pyelitis of pregnancy suggests that ascending infection from this source is of considerable importance.—*Jour. Am. Med. Assoc.*, April 21, 1923.

Prophylactic Injections in Measles.—Debre and Ravina (*Bull. Soc. Méd.*, Paris, February 15th, 1923) give their experiences in the use of serum taken from measles convalescents, as a prophylactic. The serum is tested by the Wassermann reaction before use. From 2½ to 3 c.cm. of the serum are injected intramuscularly. Children who have been exposed to measles but showed no signs themselves were vaccinated with the serum, and weakly children who were in danger of being exposed were also vaccinated, and attention was paid to certain crèches. The vaccination was particularly successful in preventing outbreaks of measles in the hospital. If a child suffering from measles was admitted by mistake, all the other children were immediately vaccinated, and by this means the authors say they have been able to escape outbreaks of measles. It does not appear that the immunity secured by this vaccination lasts long. In some cases after vaccination a modified benign form of measles occurred, characterized by very slight catarrhal symptoms, no Koplik spots, slight fever, and moderate rash. To bring about this modified measles the authors recommend injecting infected children (that is, children incubating for measles) about the seventh to the tenth day of the incubation period.—*Brit. Med. Jour.*, April 14, 1923.

The Diagnosis of Bronchial Asthma.—Charles H. Eyermann, St. Louis, stresses the fact that in addition to a thorough physical examination, a painstaking history gives us the diagnostic solution of many of our cases of paroxysmal dyspnoea. It is a history that requires patience, thoroughness, system and intelligent co-operation on the part of the patient. Such a history, with the information obtained from sensitization tests and complete physical examination, makes it possible to restrict the term bronchial asthma to those conditions that result from allergenic reaction. Bronchial asthma is an allergenic manifestation characterized by recurrent attacks of paroxysmal dyspnoea, due to spasm of the bronchioles, developing as the result of exposure to a foreign protein to which the individual is sensitized; thus such terms as cardiac, renal, uremic and winter asthma should be eliminated. The application of the term asthma to any other condition is a nosologic error, confusing to the medical profession and misleading to the patient.—*Jour. Am. Med. Assoc.*, April 21, 1923.

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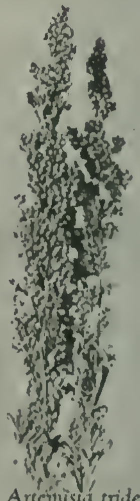

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Vol. XIII TORONTO, JULY, 1923 No. 7

LIVING SUTURES IN THE TREATMENT OF HERNIA*

W. E. Gallie, M.D., and A. B. LeMesurier, M.B.

Toronto

INTEREST in the subject of hernia has recently been aroused by the extraordinary number of recurrences which have developed after operations performed on soldiers during the war. It is impossible to estimate accurately the percentage of these recurrences, owing to the difficulty of obtaining the army records, but, from our own experience, we know that it is high. In all the army hospitals in this country large numbers of men have been operated upon a second and sometimes a third time for what were originally simple hernias. It has been suggested that the majority of these recurrences have resulted either from lack of skill among the operators or from defective after-treatment. This is an explanation which we have been unable to accept. Practically all the recurred hernias that have been referred to us for repair were operated upon originally by surgeons of recognized ability and the records have shown that these patients were accorded the best of after-care. Our conclusions have been that the failures are due in large degree to the ineffectiveness of the types of operations performed and that faith in the accepted principles of treatment is not warranted by the results.

A study of the recurred hernias which came under our observation simply showed that in most instances the muscular and aponeurotic structures which had been sewn together in an attempt to close the abdominal defect had not remained firmly healed together but had separated sufficiently to allow the protrusion of another sac. In the hope that we might find a means of preventing this misfortune we undertook a clinical and experimental study of the principles underlying the various types of operations and we are now in a position to make a report on our investigations and to point out a method by which the defect in these principles may be overcome.

The operations for hernia may be grouped into four general classes: those in which muscles and aponeuroses are drawn together or overlapped over the defect in the abdominal wall by sutures of absorbable material; those in which non-absorbable sutures are employed; those in which pedunculated flaps of muscle or fascia, or free transplants of fascia, are sutured into or over the defect with absorbable or non-absorbable sutures; and those in which foreign materials, such as filigrees of silver wire, are used to support the weak spot in the wall. The latter method has been practically abandoned owing to the frequency with which the wounds suppurate and to the tendency of the foreign material to set up late irritation which can only be relieved by its removal, so that further investigation of this method is unnecessary. The other methods are in common use, however, and to these our attention has been directed.

In the preliminary experiments the simple healing of wounds in fascia and aponeurosis was investigated. Longitudinal and transverse incisions were made in these structures in the backs of rabbits and closed with catgut sutures. The specimens were recovered at varying intervals up to several months. Immediately following the operation there was an acute inflammatory reaction in the area with the formation of a film of new connective tissue over the line of the incision and in the space between the edges of the wound. (Fig. 1). This film consisted at first of an ordinary granulation tissue composed of proliferating cells and blood-capillaries. After a week the cells and blood-vessels began to disappear and their place was taken by irregularly arranged connective tissue fibres. This new tissue was continuous with the areolar membranes which are normally on the surface of the fascia and aponeurosis, and, after the lapse of a few weeks, had become practically indistinguishable from them. In no case did we observe any evidence of inflammatory reaction in the cells of the fascia or aponeurosis themselves, nor did we see anything to indicate that these tissues contributed to the production of the new tissue in the line of the scar. In none of the specimens did this newly formed scar tissue resemble adult fibrous tissue in the parallel arrangement of fibres. It was characterized, on the contrary, by irregularity of the fibres, and as time went on it grew more and more to resemble the areolar membranes which clothe these structures. (Fig. 2). From a histological point of view, therefore, the bond of union between the cut edges of the fascia and aponeurosis appeared to be decidedly weaker than these tissues themselves and it seemed likely that the line of union would always constitute a weak spot when the area was subjected to strain. This conclusion was amply supported by the naked eye appearances of the specimens examined after the lapse of weeks and months, for it was almost invariably found that in those specimens in which the edges of the wound had been sutured under tension, or in which the line of sutures was subsequently subjected to strain, separation had resulted owing to the stretching of the scar.

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*Read before the Ontario Medical Association, June, 1921. Received for publication, May 29th, 1923.

In a second series of experiments the catgut used to approximate the edges of the wound was replaced by silk and linen. In the specimens recovered after these operations the tendency of the sutured edges to separate was less marked than when absorbable sutures were employed. In some cases the sutures remained permanently in position surrounded and supported by dense scar tissue. In others, although the sutures had cut out, the amount of scar tissue in the line of suture was so abundant and dense that it appeared to be quite strong enough to prevent any tendency of the edges of the wound to separate. In many, however, the separation had occurred as when catgut was used and the sutures were found to have cut out from one side or the other and the scar to have stretched.

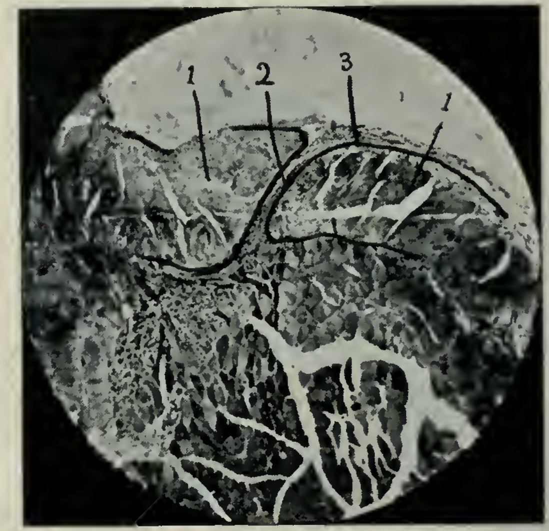

Fig. 1

Healing of incision in aponeurosis, three weeks after suture. (1) Aponeurosis on either side of incision. (2) New tissue filling in the space between the edges of the wound. This new tissue is apparently derived from the normal areolar covering of the aponeurosis. (3) It will be noted that the aponeurosis itself seems to take no part in the process of repair.

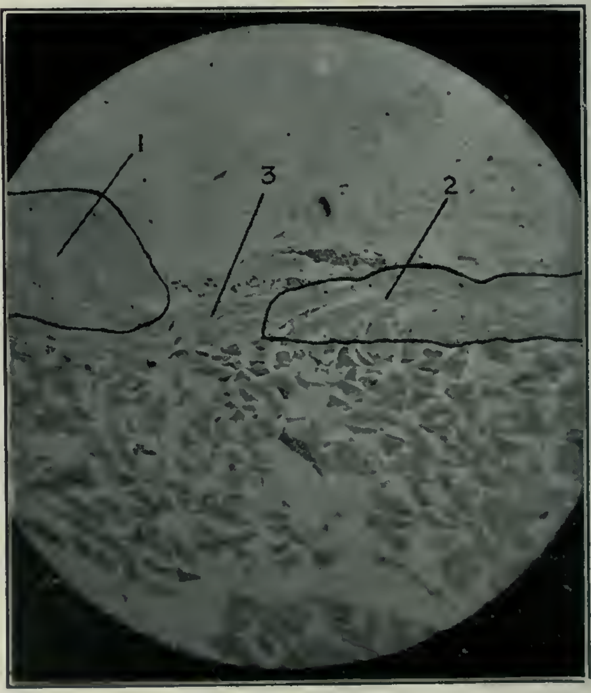

Fig. 2

Healing of incision in aponeurosis, thirteen months after suture. (1) and (2) Aponeurosis on either side of incision. (3) New tissue uniting edges of wound. This new tissue shows the irregular arrangement of fibres, and slight stretching under strain.

Herein lies the explanation, therefore, of many of the failures which have attended attempts to close simple inguinal hernias, and particularly direct inguinal hernias and the large hernias which develop in the line of incision of former abdominal operations or in the region of the umbilicus. In these cases the surgeons have depended for closure of the defect in the abdominal wall upon simple suture of the aponeurotic structures which constituted the hernial ring, and have not appreciated the fact that the scar which forms is unequal to the strain to which the abdominal wall is normally subjected. The experiments demonstrate the risk also which invariably attends abdominal operations in which incisions are made in the middle line or in the linea semilunaris. In such patients every increase in intra-abdominal pressure and every strong contraction of the muscles of the abdominal wall tend to draw the edges of the former incision apart, with the result that post-operative hernia after such incisions is exceedingly frequent.

In order that we might investigate more closely the process of healing after the simplest operations for hernia, as, for example, the operation for the cure of oblique inguinal hernia, a series of experiments was performed in which the various steps of the operation were imitated as closely as possible. In the operation for inguinal hernia, after removal of the sac, the internal oblique muscle and the conjoined tendon are sutured to the reflected portion of Poupart's ligament by catgut or some form of non-absorbable material. In animals, however, the inguinal canal is so different from that of the human being, in that it naturally tends to close with every contraction of the abdominal muscles, and, owing to the arrangement of the animal's body and limbs, is protected from effects of increased intra-abdominal pressure, that we performed our experiments on the animal's back where something more comparable with the conditions in the human inguinal region could be obtained. In one group of experiments the fascia of the back was exposed and two folds of the fascia picked up with forceps and sutured together with catgut. In another group the fascia was raised from the underlying muscle and then sutured to it for a distance of an inch or more. In a third group of experiments two neighbouring parallel muscles were simply sewn together for a similar distance. When the specimens were recovered some weeks later there was no evidence whatever that any operation had been performed. The plicated fascia had simply flattened out into its former position after the absorption of the sutures and the suture line between the aponeurosis and muscles and between muscle and muscle has completely disappeared.

That this sequence of events occurs not infrequently after operations for inguinal hernia is well known, for many operators have reported that at a second operation for the repair of a hernia they have observed that the internal oblique, which had previously been sewn down to Poupart's ligament, had returned to its normal position and there was nothing to show that its normal relations had ever been disturbed. Over and over again we have made this same observation in patients upon whom we have operated for recurred hernia, particularly in regard to the suture of the conjoined tendon to the ligament. It would seem, therefore, that the simple suture of the muscle or tendon to Poupart's ligament adds little, in many cases, to the probability of a cure.

That this wide separation of the sutured structures does not always occur is equally true, however, and is readily explained by a simple modification of the experiments. If, before suturing muscle to muscle, or fascia to muscle, or fascia to fascia, the structures be thoroughly cleared of all areolar tissue, or preferably if they be deliberately scarified, varying degrees of adhesion will certainly take place. This is particularly true of the muscles and it is readily explained if one considers the structure of muscle. Muscle is composed of bundles of parallel fibres separated by a stroma of fibrous connective tissue which is continuous with the sheath which clothes the surfaces. When a muscle is injured the repair is accomplished practically altogether by the connective tissue of the stroma, so that when wounded muscles are sutured, or scarified muscle surfaces held in contact, solid union occurs owing to the healing together of the divided connective tissue stroma. This stroma has such an intimate connection with the depths of the muscle that when healing is completed the line of union is very strong and is able to withstand any ordinary degree of strain. To a certain extent this is true also of fascia, aponeurosis and tendon, for these structures are likewise formed of bundles of parallel fibres which are enclosed in a sheath and stroma of less regularly arranged connective tissue. The stroma in these structures is so scanty, however, when compared with muscles, and the area of the injured surfaces which are placed in contact is so small, when they are sutured together in edge to edge apposition, that the bond of union is very delicate and the connection of the scar with the stroma of the interior is slight. In order, therefore, that fascial or aponeurotic structures may be induced to heal together with sufficient strength to withstand the strain to which these structures are normally subjected, some means must be discovered of increasing the amount of scar tissue forming in the line of union and of increasing the intimacy with which it is connected with the depths of the tissue. This may be done by thorough scarification of the fascia or aponeurosis before it is sutured, and by freely overlapping the edges. This principle has been well recognized in operations for the cure of ventral hernia, but is almost universally neglected in the operations on the inguinal canal, and it undoubtedly accounts for many of the unsuccessful results in direct hernia, where closure of the defect in the abdominal wall is the all-important feature of the operation.

But while our experiments demonstrated that scarifying and overlapping the edges of divided fasciae and aponeuroses did increase the probability of permanent union, yet even these precautions were insufficient when the line of union was subjected to unusual strain. Frequently the edges drew apart leaving a defect which was filled with very feeble areolar or scar tissue. Thus is explained the high percentage of recurrences after operation for large ventral hernias, particularly in patients with wide hernial rings and with large amounts of intra-abdominal fat. The experiments also demonstrate the folly of subjecting such patients to the doubtful chance of a cure when the edges of the defect in the abdominal wall can only be dragged together or overlapped by means of Kocher clamps and can only be held in position by heavy kangaroo tendon sutures. Such operations surely invite disaster.

The search for a method by which the number of failures attending such operations might be reduced led to the idea of filling the defects in the abdominal wall with pedunculated transplants of aponeurosis or free transplants of fascia lata. It had been demonstrated that such transplants, when placed in such a position that they received an adequate supply of lymph, continued to live unchanged, and it appeared reasonable to suppose that the principle might be used to advantage in cases of hernia in which the edges of the ring could not be drawn together, or in which they could only be brought together under great tension. In this way was developed the operation for direct inguinal hernia in which a pedunculated flap was turned down from the sheath of the rectus and sutured to Poupart's ligament in such a way as to fill up the triangular space between the edge of the rectus and the ligament. The free fascial transplants were used to close the abdominal defects in large ventral hernias or to support the line of suture when the edges of the ring had been drawn together. It soon became apparent, however, that the method was by no means certain to accomplish a cure, for patients still continued to present themselves in whom the hernia had recurred. So little did the principle improve the percentage of cures, and so great was the added difficulty of the operation, that the method was very soon abandoned and is now practically never employed.

Our investigation has shown quite clearly the reason for these disappointing results. In a series of experiments we removed patches of fascia and aponeurosis from the backs of various animals and immediately fastened them back into their original position with sutures of various kinds. As indicated in our previous paper,* these transplants continued to live practically unchanged. During the first two weeks a mild inflammatory reaction developed, as evidenced at first by oedema of the transplant and of the neighbouring tissues, and later by proliferation of the blood-vessels and connective tissue cells of the film of areolar tissue which lies on the surface of the fascia. The tendon cells and fibres of the transplant appeared to take no part in the process. As time went on the inflammatory reaction subsided, leaving the transplant exactly as it was before the operation and held in position by delicate scar tissue derived from the areolar fibres of the neighbourhood. If the investigation had gone no further, it would have seemed that the principle thus demonstrated would solve completely the problem of closing hernial defects. We soon found, however, that this satisfactory healing-in of the transplant only took place when the line of suture was subjected to no strain. Whenever it was found that the suture of the transplant to the edge of the defect could be accomplished only with considerable tension on

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*The Use of Living Sutures in Operative Surgery. *Canadian Medical Association Journal*, July, 1921.

the suture material, or when it could be seen that the normal activities of the animal would produce strain on the line of healing, it was invariably found that after a few weeks the edges of the transplant and the defect had separated exactly as occurred in the simple incised wounds in fascia described above. The separation was due to the stretching of the scar in the line of union. As in the case of incised wounds, we also tried overlapping the edges of the transplants and the surrounding fascia. This undoubtedly reduced the tendency of the edges to separate, particularly if the opposed surfaces were thoroughly denuded of areolar tissue and scarified, but even when these precautions were taken, separation frequently took place, leaving a defect which was filled only with thinned out scar tissue. (Fig. 3). These experiments demonstrate very clearly, therefore, the reason for the frequent failures which attend the ordinary operations for closure of hernial defects, and they show conclusively that before we can approach these conditions with any certainty of success we must be able to provide some means of holding the edges of the hernial ring together which is stronger than the scar tissue which develops in the ordinary process of repair.

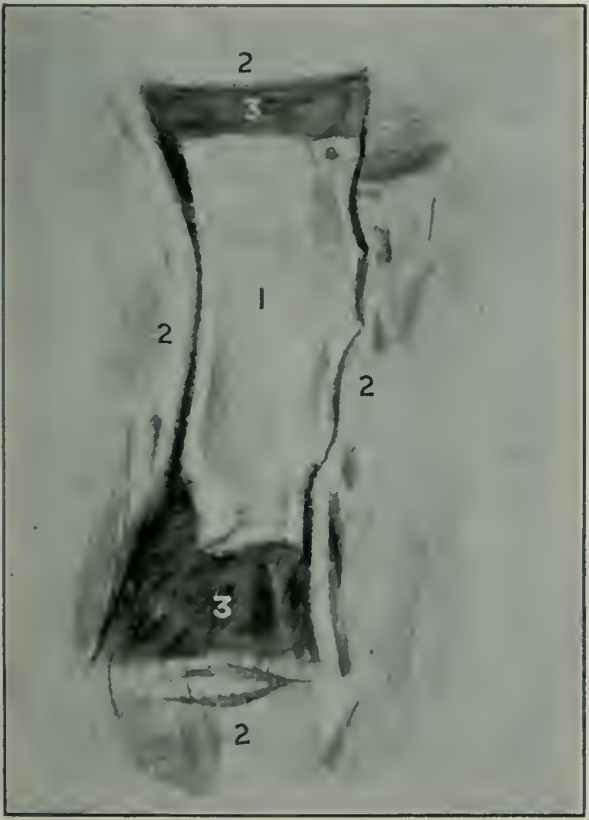

FIG. 3

"Patch" transplant of aponeurosis after thirteen months. (1) Aponeurotic transplant. (2) Normal aponeurosis forming edges of gap. (3) Thin film of new tissue uniting the two. At the operation, the transplant was accurately sutured all around its edge to the normal aponeurosis. Union has taken place by the formation of scar tissue, which has stretched considerably.

It was during a search for some method by which we might overcome this difficulty that the idea of using living sutures occurred to us. The experiments by which the method was developed have already been outlined in our previous paper, but a brief review of the subject will be of value in applying the principle involved to the treatment of hernia. In these experiments we removed long strips of fascia, a quarter of an inch wide, from the rabbits' backs, and, threading them into large-eyed needles used them as sutures to prevent the edges of the gap in the fascia from spreading. The edges of the gap were left approximately a half an inch apart, in order that the whole strain might come on the suture without assistance from scar tissue. The specimens have been recovered at intervals of weeks up to two years. By this means we have been able to demonstrate that sutures obtained in this way behave like ordinary fascial grafts. (Fig. 4). They continue to live practically unchanged. As a result of following the needle through a tight needle hole, they become folded into rounded cords, and, in the course of two to three weeks, become surrounded with a vascular

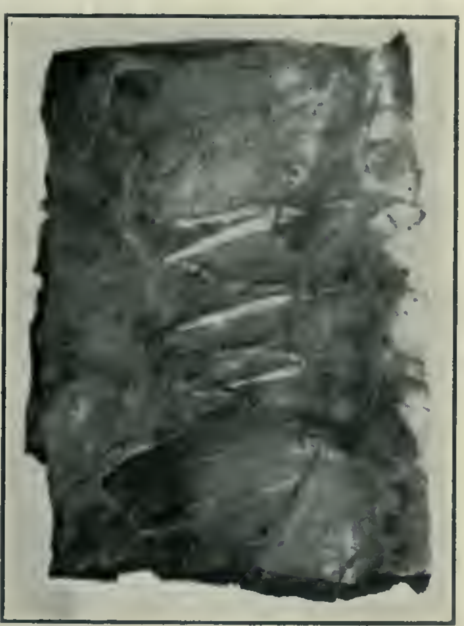

FIG. 4

Gross appearance of fascial suture two years after its insertion. It is now a rounded, glistening cord, closely resembling tendon.

areolar film which sends septa of similar tissue into the depths of the cord in the spaces left between the folds. A cross section of the suture at this time and later has the appearance of a normal tendon. (Fig. 5 & 6). By testing in a special machine the tensile strength of sutures at the time of the operation and again at the time of the autopsy we were able to demonstrate fairly accurately that no appreciable change takes place after the transplantation. Further, by fastening black silk markers on the living suture at accurately measured intervals, we found that no stretching or contraction occurs which could interfere with the success of an operation. It seems conclusively demonstrated, therefore, that in strips of fascia lata we have a suture material which is ideal for use in operations in which it is desired to hold together structures, such as the edges of hernial rings, which naturally tend to separate. It remains only for the surgeon to employ a technique which ensures that the suture is solidly anchored into unyielding tissue, such as healthy muscle and aponeurosis, and to make sure that a sufficient quantity of the suture is employed to withstand the anticipated strain and to completely fill the gap where the edges cannot actually be drawn together. From our experimental evidence, the advantages of the living sutures are briefly these: Over catgut and similar sutures they have the great advantage that they are not absorbed and that they continue for all time to perform the function for which they were originally intended. Over silk and other non-absorbable materials they have the advantage that they are composed of living tissue which is perfectly non-irritant, and that they heal solidly into the structures through which they pass without showing any tendency to cut out when subjected to ordinary physiological strain. In operations designed to close gaps in which the edges cannot be drawn together the living sutures have the advantage over patch transplants that they do not depend for their success on the process of healing by scar tissue, but solely on the mechanical grip which they obtain on the edges of the ring. By weaving the sutures across the gap, as in the darning of a sock, a wall of great strength can be constructed which can be depended upon to resist successfully any ordinary degree of intra-abdominal pressure and any ordinary muscular strain.

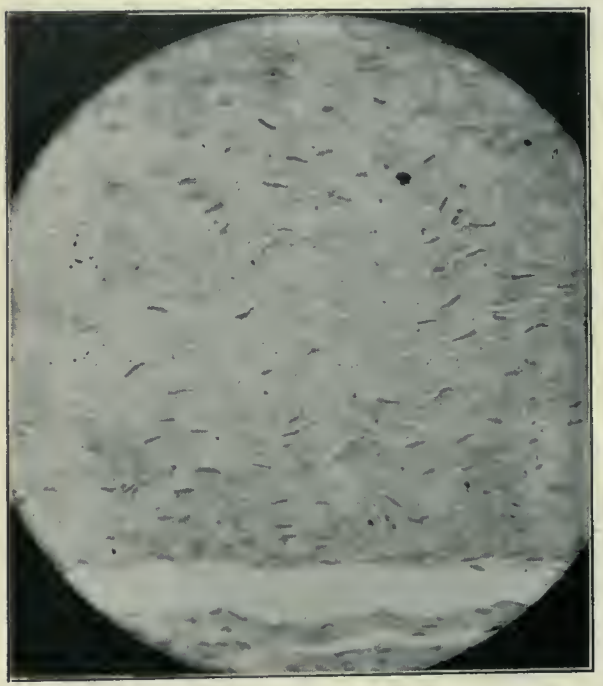

Fig. 5

Longitudinal section of fascial suture, showing persistence of regular, parallel arrangement of fibres.

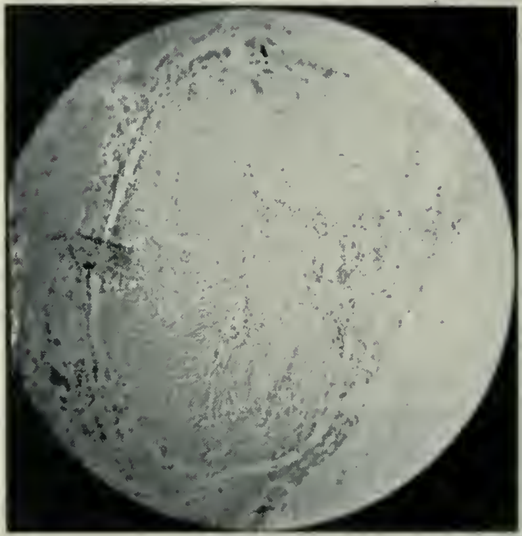

Fig. 6

Cross section of fascial suture after two years. It is now a rounded cord resembling tendon, and consisting of a mass of parallel fibres, with a few vascular connective tissue septa.

During our experimental investigations and in all the various operations in which the principle has been used, we have found certain points in technique worth observing. To avoid wasting valuable time in threading the needle we use a needle with a large eye. The strip of fascia is tied securely into the needle with catgut or silk, to prevent unthreading, and a ligature of catgut is tied around its terminal end to prevent it from splitting. In taking the first stitch the needle is passed through one of the edges of the gap to be closed and then through the terminal end of the suture, and drawn taut. (Fig. 7, [1]). By this means a sort of slip-knot is provided, which forms an excellent anchor. Where it is expected that great strain will be placed on the suture, we sometimes take a second similar stitch to make doubly sure that the anchor will hold. The closure of the opening is then proceeded with. The suture is woven strongly into the edges with as many bites as seem necessary and passed backward and forward across the opening until its whole length is closed. Owing to the slippery character of the fascia, it will be found useful to anchor the sutures at every second or third stitch by some form of knot. We usually combine a single loop knot with transfixion as shown in the diagram (Fig. 7, [3].). When the first suture has been used up a second may be attached to it in the same way as pieces of tennis gut are fastened together, (Fig. 7, [5 & 6].) and the sewing continued. The suture may be ended by splitting the terminal end and tying the two strands thus produced about itself in a triple knot. (Fig. 7, [4],). This knot should be made secure by transfixing it with a catgut ligature which will hold its loops in contact until they become firmly healed together.

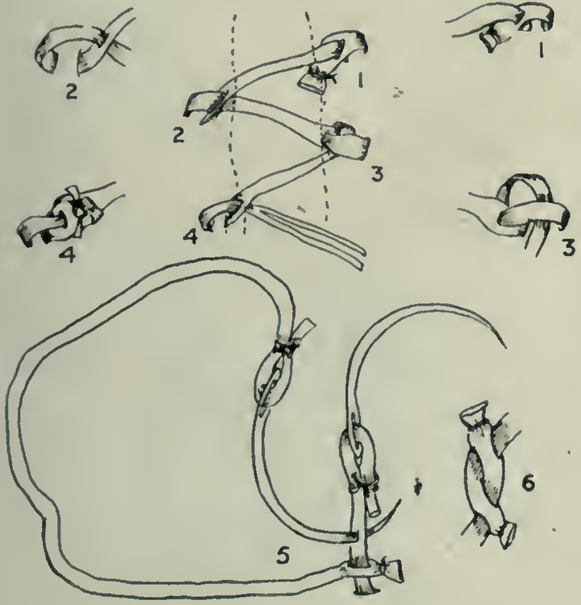

FIG. 7

Diagram showing method of inserting fascial suture. (1) Anchoring suture at its commencement by looping it through itself. (2) Fixation of suture at each loop by passing it through itself. (3) Fixation by transfixion and knot. (4) Ending of suture by passing through itself, splitting, and tying end in knot. (5) Method of joining new suture to one that has been inserted. (6) Join completed.

Inguinal hernia is a condition which is generally supposed to be readily curable by operation. Published statistics, such as those of Coley, in which thousands of operations are recorded with less than one per cent. of recurrences, amply support this idea. If these statistics are analyzed, however, it will be found that the great majority of the operations have been performed on children in whom the cause for the hernia may be entirely attributed to an error in development which results in the persistance after birth of a patent funicular process. In these patients there is no defect in the abdominal wall and a cure can be confidently expected if the sac is completely removed. What one does to the abdominal wall in these cases appears to be of very little importance, for all the modern methods seem to be equally successful and these include some in which no suturing of the muscles or aponeurosis is performed. In adults, however, the problem is different, for here in addition to the sac one has to deal very frequently with a definite defect in the abdominal wall. This defect may be the simple result of the chronicity of the hernia which after the lapse of years has so distorted the inguinal canal that it has lost its original obliquity and is now a more or less direct passage through the abdominal wall. In other cases the primary defect is in the abdominal wall itself, which for one cause or another becomes so weak that it is unable to withstand the intra-abdominal pressure. The result is a direct hernia. Both these types of hernia present an entirely different problem from the hernia of childhood, and all thoughtful surgeons must admit that the results of operation for their cure are by no means ideal. In direct hernia the published records indicate that recurrences can be anticipated in nearly fifty per cent. of the cases operated upon, and the percentage increases with the age of the patients. So small are the chances of obtaining a cure in patients over fifty years of age that most surgeons advise these patients to content themselves with some form of truss.

From the considerations which have been outlined above, the reason for the high percentage of recurrences is obvious. In practically all operations used in the treatment of inguinal hernia, the hope of a cure is based on the closure of the weak spot in the abdominal wall by suturing together the muscles and aponeuroses which form its boundaries. After the removal of the sac, the internal oblique muscle and the conjoined tendon are sewn to the reflected portion of Poupart's ligament and the patient kept at rest until it is thought that these structures are firmly healed together. Unfortunately the muscles and aponeuroses do not always remain healed together. If the operation has been done without the thorough removal of areolar tissue and scarification of the sutured surfaces, they will return to their natural position soon after the sutures cease to be effective, and, even when care is taken to scarify the edges of the muscles and aponeuroses, a considerable percentage of recurrences must be anticipated where the primary cause of the hernia, such as increased abdominal tension or hard physical labour, is still active after the operation. In these cases the gradual stretching of the scar frequently leads to a recurrence of the abdominal defect, particularly in the region of pubic spine. But it is chiefly in direct inguinal hernia, in which the primary cause is weakness of the abdominal muscles, that failures are frequent. Here it does not much matter whether the line of suture holds or not, for the hernia will recur by pushing its way through these muscles themselves. To overcome this tendency some operators resort to the absurd method of inserting their sutures far back in the rectus sheath and abdominal aponeurosis, and dragging these structures into contact with Poupart's ligament. As a result the patient is doubled up in a most uncomfortable manner and he remains so until the sutures give way and the stretching of the scar allows the abdominal muscles to return to their natural position. Clinical and experimental evidence have demonstrated the folly of expecting the edges of aponeurotic structures to remain together under high degrees of strain.

/The use of living sutures appears to have solved most of these difficulties. The general plan of our operation resembles that of Bassini. The sac is removed, the spine and crest of the pubic bone exposed, and the recurved edges of Poupart's ligament, the internal oblique muscle and conjoined tendon, and the junction of the internal oblique muscles in the abdominal aponeurosis thoroughly cleared. Through a long incision on the outer side of the opposite thigh the fascia lata is exposed and cleared of areolar tissue. With a knife a small incision is made in the fascia, parallel with its fibres, and with a blunt-pointed scissors the fascia is ripped to the desired length, nine or ten inches if possible. A similar incision is made a quarter of an inch lateral to the first one and one end of the suture thus prepared is cut free from the thigh. It is then tied into the large-eyed needle with catgut and finally lifted free of the muscles and severed at the end which is still attached. About this end is tied a catgut ligature to prevent it from becoming frayed. The strip of fascia is then transferred to the hernial wound and the suturing commenced. The anchoring stitch is passed through the anterior layer of the rectus sheath and the rectus muscle, close to their attachment at the pubic bone. From here it crosses the gap in the abdominal wall to the pubic spine, where it is securely fixed into the periosteum and termination of Poupart's ligament. In this way a strong support is provided at the place where hernias are most apt to recur. The suture is then continued in an outward direction, closing the edge of the internal oblique muscle to the recurved portion of Poupart's ligament, until the internal ring is reached. Here the suture is knotted and then passed to the outer side of the cord, as shown in (Fig. 8), so that a new ring of fascia lata is formed. By this means the weak spot produced by the passage of the cord through the abdominal wall is adequately supported. In some cases this single line of sutures might be sufficient to establish a cure, but, in the majority of patients with direct hernia, the abdominal muscles are so weak that they cannot be depended upon to resist severe intra-abdominal pressure. To prevent the possible stretching of the internal oblique muscle, therefore, we insert a second line of sutures, super-

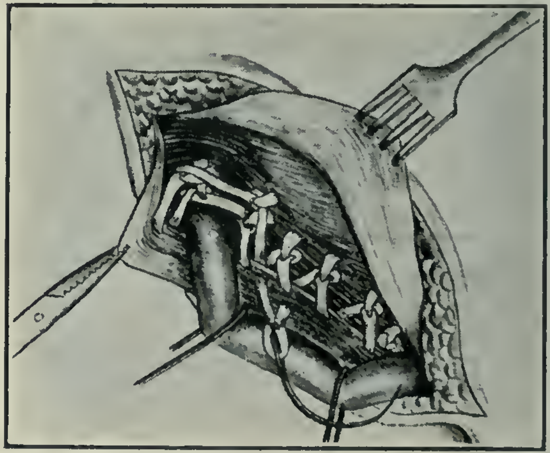

FIG. 8

Repair of inguinal hernia. Insertion of first row of fascial sutures, and reinforcement of internal ring.

imposed on the first, which passes from the strong abdominal aponeurosis at the junction of the internal and external oblique muscles and from the anterior sheath of the rectus to Poupart's ligament. (Fig. 9). No attempt is made to draw these aponeurotic structures tightly together. The sutures are simply drawn sufficiently taut to make them lie flat. They are placed close together and made to pass under or through the first line of sutures, as in the weaving of a basket. In this way the weak spot in the abdominal wall is completely and permanently covered in by muscle and strong fascia and, if care is taken in securing good anchorage for the sutures, there would appear to be no possibility of a hernia ever pushing its way through. The cord is now dropped back into its new bed and the external oblique closed. In cases in which this structure is strong it is simply sutured with catgut but whenever it is stretched or weakened in any way it is woven together with a narrow strand of fascia. (Fig. 10). Great care is taken in making the new external ring to see that it fits the cord closely and that it is situated in front of the pubic bone. By these precautions a potential weak spot is avoided.

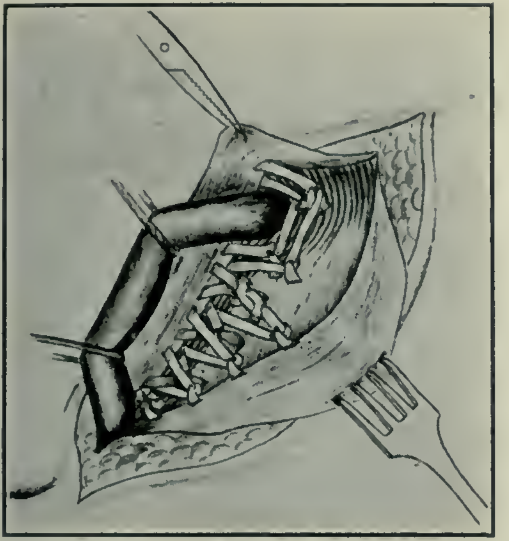

Fig. 9

Repair of inguinal hernia. Insertion of second row of sutures. These are fixed above by a deep bite into the line of junction of the internal and external oblique aponeurosis, and are placed somewhat more closely together than in the illustration.

Our clinical experience with the treatment of inguinal hernia by living sutures is now quite extensive. The method has been used in many cases, also, by our *confrères*, but as we have not had an opportunity to examine the patients or to see all the operations, they are not included in this report. Our own series is composed of sixty cases, the great majority of which were either direct inguinal hernias, or direct or indirect hernias which had recurred after operation. Ten of the cases had been operated upon twice or three times previously and consequently offered a severe test to the efficiency of any new operative procedure. No cases are reported in which at least two years has not elapsed since the operation, and, in most instances, four years have gone by since the method was employed. In this series there have been no recurrences. The abdominal wall in each case is very strong and there is no sign of bulging and no complaint of the pain or tenderness which is the usual precursor of recurrence. In some of the cases the knots and strands of the suture can be felt distinctly through the skin after the lapse of from three to four years. We are in high hopes, therefore, that we have solved the difficulty of curing this hitherto troublesome condition.

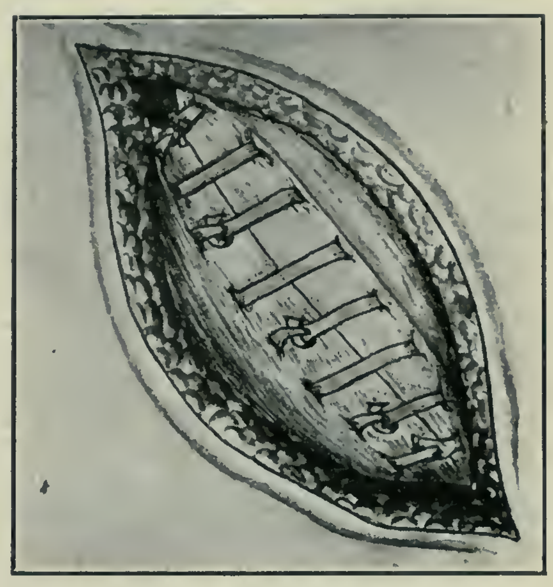

Fig. 10

Repair of inguinal hernia. Closure of external oblique aponeurosis.

In order that there may be no misunderstanding as to what cases we consider require this form of treatment, we shall outline our views briefly. It is unnecessary, of course, in children and also in young adults suffering from recently discovered oblique hernia. For all cases of direct inguinal hernia, however, and for all cases of oblique inguinal hernia which have recurred after operation, or which have appeared for the first time in patients at or beyond middle life, we feel that closure of the canal with living sutures offers the best prospect of a cure. We recommend it also in adult patients who have had the hernia for a long time and whose inguinal canals have, as a result, lost their obliquity. So confident are we that the sutures of fascia lata, if firmly anchored into unyielding aponeurotic structures, will permanently close the inguinal canal, that we cannot conceive of a hernia so unfavourable that a permanent cure could not be anticipated.

We have, unfortunately, not had an opportunity to test the method thoroughly in femoral hernia, but the small experience we have had has convinced us that it will be as useful here as in inguinal hernia. After the removal of the sac, the cure of femoral hernia is entrusted to the closure of the femoral ring by stitching the recurved portion of Poupart's ligament to the thickened portion of the ileo-pectineal fascia known as Cowper's ligament. This is sometimes done through an incision in the thigh, and sometimes through the ordinary inguinal hernia incision. The latter is the more rational approach, as through it the canal can be closed off at its entrance. Our researches have shown, however, that any method of suture with absorbable or non-absorbable material, of structures such as Poupart's ligament and the pectineal fascia, which tend with every contraction of the abdominal or thigh muscles to draw apart, cannot be considered satisfactory, as the ultimate union of these structures must depend on areolar or scar tissue. The high percentage of recurrences amply supports this view. When sutures of fascia lata are used it is no longer necessary to draw Poupart's ligament tightly down to the pectineal fascia, as the femoral ring can now be closed off equally effectively by a strip of fascia anchored into Poupart's ligament, which crosses the mouth of the crural canal to a second anchorage in the pectineal fascia or the periosteum of the ramus of the pubic bone. This suture is passed backward and forward until the opening is thoroughly closed off. It should catch into Gimbernat's ligament on the inner side and the sheath of the femoral vein on the outer side. It is simply drawn sufficiently tight to make it lie flat, and so does not cause any constriction of the vessels as they pass into the thigh. Such an operation is, in reality, an effort to extend Gimbernat's ligament in an outward direction so that its base, instead of forming the internal boundary of the femoral ring, now forms the inner boundary of the compartment of the femoral sheath through which passes the femoral vein. The extended ligament, therefore, shuts off the opening of the crural canal. We have not had sufficient clinical experience with this method to know whether the final results will be as satisfactory as in inguinal hernia, but, from a theoretical standpoint, we are quite satisfied that they will.

While the various types of inguinal and femoral hernia often give disappointing results after the ordinary types of operation, they cannot be compared in difficulty with the large ventral hernias which are constantly appearing for treatment, nor are the general results anything like so unsatisfactory. No surgeon approaches a large ventral hernia without misgivings as to his ability to close it, and without fear that the closure, if secured, will ultimately prove ineffective. The result has been the multiplication of methods of procedure, all searching for methods of securing more stable healing of the edges of the opening, or of reducing the strain to which the line of union is subjected. Thus have been introduced the various methods of overlapping the muscles and aponeuroses, the use of the wire filigree, and the employment of large patches of fascia lata. With the exception of the wire filigree, which has its own peculiar disadvantage, all these methods have the same defect in that they are depending for permanent closure on scar or areolar tissue. This is the condition to which the principle of living sutures is most readily applicable, and in which its use will give the most immediate brilliant results. We are no longer greatly concerned as to whether we can actually draw the edges together or make them overlap, for we know that we can almost as effectively close the opening by weaving in the strips of fascia lata. We also know that these fascial sutures cannot stretch or break, and, if we weave them securely into resistant structures in the edges, they will maintain the closure of the opening for all time.

The technique is perfectly simple. The sac is removed and the peritoneum closed as in the ordinary operation. The edges of the opening are thoroughly exposed and may be dissected so as to demonstrate their various anatomical layers. If this cannot be done without greatly weakening these layers, however, it is better to dispense with it and trust to the grip of several layers of sutures into the matted edges. The sutures are inserted, as already described, until not a crevice is left through which the peritoneum can protrude. (Fig. 11). It is wise to overlay the first row of sutures with others which are woven into strong tissues well back from the edges of the opening, somewhat as in the lacing of a shoe. (Fig. 12). These correspond with the superficial layer described in the closure of direct inguinal hernia, and are of value in diffusing the strain.

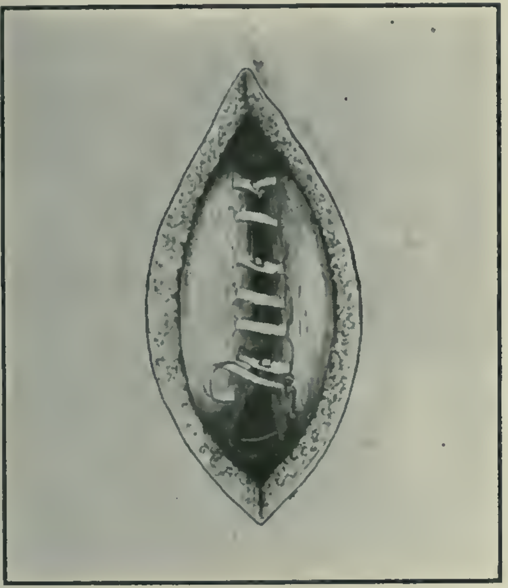

FIG. 11

Repair of ventral hernia. Insertion of first row of fascial sutures, bringing edges of defect as nearly as possible together.

Our experience with this type of operation has been most satisfactory. The cases have all been difficult ones, and of such enormous size that there was practically no hope of permanent closure from the ordinary operation. Up to the present time there have been no recurrences. One case will serve to illustrate the value of the method. A soldier was admitted to Christie Street Hospital with a huge ventral hernia resulting from a shell wound which had torn away the upper half of the right rectus muscle and the adjacent abdominal muscles and aponeuroses. The hernia was half the size of a football and the ring measured seven inches by four. All who saw him agreed that he could not be cured by any of the recognized methods. This man was operated on as described. The edges of the opening were left as a solid mat, and were drawn as closely together as possible with fascial sutures. The gaps which could not be closed were filled with fascia woven together as described. It is now three years since the operation and he is engaged in his ordinary trade without disability and with an abdominal wall which seems as strong as normal.

In all the cases in which living sutures have been obtained from the thigh we have watched carefully for any signs or symptoms in the limb which might be considered reasons against the use of fascia lata. Up to the present, no patient has mentioned the thigh and we have been unable to detect any disability resulting from the operation. When the required number of sutures have been removed, the gap in the fascia is simply closed with catgut, and by the time the patient is ready to get out of bed the wound in the thigh is firmly healed. In several instances we have been unable to close the gap in the fascia but in no case has a disability resulted.

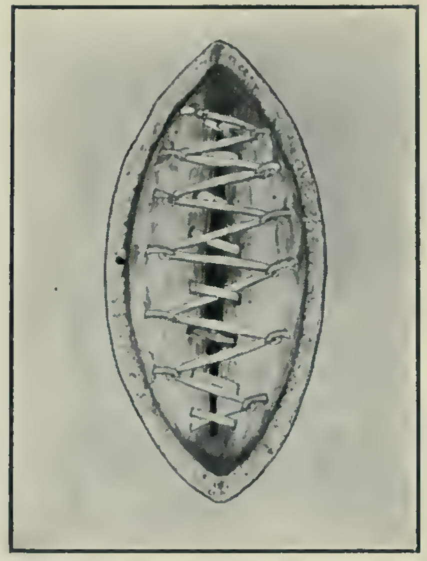

FIG. 12

Repair of ventral hernia. Insertion of second row of sutures, fixed at points some distance back from the edge. At each point of insertion the suture is knotted to prevent slipping. The sutures should be inserted somewhat more closely together than shown in the diagram.

Since this paper was read at the meeting of the Ontario Medical Association at Niagara Falls, two years have been allowed to elapse before presenting it for publication. This has been done deliberately in order that the statements made at that meeting might be subjected to the test of time. We feel that we are now in a position, both from our own experience and that of our colleagues, to recommend the general adoption of the principles outlined. If these principles are followed, we believe we have at our command a method of dealing with doubtful and difficult hernias which will give general satisfaction and considerably widen the field to which surgical treatment is applicable.

INSULIN: ITS ACTION: ITS THERAPEUTIC VALUE IN DIABETES, AND ITS MANUFACTURE

The Insulin Committee of The University of Toronto

CARBOHYDRATES, such as the starches, taken in the food, are converted into simple sugars, such as glucose. In this form it is absorbed by the intestines and carried to the liver where much of it is stored as glycogen. The remainder is carried to the muscles and other tissues where some of it is oxidized and some stored as glycogen. Prior to these changes, glucose in some way becomes altered in chemical structure so as to change it from an inactive into an active form. In diabetes mellitus it is probable that the sugar absorbed from the intestine is no longer properly changed into the active form so that it cannot be stored in the liver as glycogen, nor oxidized in the tissues, but circulates in increased quantitites in the blood (hyperglycaemia) and is excreted in the urine (glycosuria). It therefore becomes lost to the body as a source of energy. As a result, the source of glycogen is rapidly exhausted, and protein is attacked as a source for glucose. Further, as carbohydrate is necessary for the normal metabolism of fat in the body, incomplete combustion of fat occurs in diabetes mellitus, resulting in diabetic acidosis and coma. Diabetes mellitus must, therefore, be considered as a disease of metabolism in which carbohydrate is not sufficiently utilized by the body, thereby causing a derangement of the normal metabolism of proteins and fats as well as carbohydrates. This derangement of metabolism is recognized by voracious appetite, hyperglycaemia (increase in the percentage of sugar in the blood) and glycosuria (sugar in the urine).

Discovery of Insulin

As a result of the experiments of Von Mering and Minkowski, in which they showed that extirpation of the pancreas in dogs was followed by persistent glycosuria and other symptoms of diabetes, the important relation between this gland and diabetes was established. The pancreas consists of two types of tissue; the acinar portion secreting the pancreatic juice (the external secretion) which reaches the intestine through the pancreatic duct, and groups of cells scattered throughout the gland known as "the islands of Langerhans." These cells possess a rich supply of blood vessels. As the islands of Langerhans show pathological changes of varying degrees up to complete destruction in the majority of cases dying of diabetes mellitus, Opie and others have considered that the insular portion of the pancreas is the one related to diabetes mellitus. They believed that it probably furnished an internal secretion necessary to normal carbohydrate metabolism. Several investigators attempted to prepare extracts of pancreas containing this internal secretion but with uncertain results, probably because the active substance was destroyed by the powerful digestive ferments also present in such extracts. It has remained for Banting, working in collaboration with Best in the department of Physiology, under the direction of Professor MacLeod, to demonstrate that such an internal secretion really exists, and thereby to determine the exact relationship of the pancreas to the disease diabetes mellitus.

It had been shown previously that, if the duct of the pancreas was ligated, degeneration occurred much more rapidly in the acinar portion than in the islands of Langerhans. Banting conceived the idea that, if an extract was prepared from the pancreatic tissue remaining some time after ligation of the ducts, it should contain the supposed internal secretion of the islands of

Langerhans because there would not be enough of the digestive ferments to destroy it. In 1921, Banting and Best prepared an extract of the degenerated pancreas and injected it into diabetic dogs. Following the injection a definite lowering of the blood sugar, and a decrease in the amount of sugar excreted in the urine was found to occur. They were able to show that, if sufficient extract was injected at proper intervals, completely depancreatized dogs could be kept alive and free of symptoms for a long period of time. These experiments proved that the islands of Langerhans in the pancreas contain a substance which lowers the blood sugar and diminishes or abolishes the excretion of sugar in the urine of diabetic dogs. Later, by extracting the foetal or adult normal pancreas with alcohol, they prepared an extract which contained the antidiabetic substance or hormone, the alcohol evidently preventing the destruction of the active principle by the digestive ferments. This extract was injected subcutaneously into a boy suffering from severe diabetes mellitus A definite lowering of the blood sugar, and of the amount of sugar excreted in the urine resulted. The extract contained other substances which caused considerable local irritation, making repeated injection of the material in that form impossible. With the assistance of J. B. Collip, an extract was prepared in a purer form, suitable for repeated injection in man. The active principle of these extracts has been called "Insulin" a name previously suggested by Sir E. Sharpey Schafer.

Physiological Action of Insulin

At this stage intensive investigation was conducted in the physiological laboratory of the University to determine the effects of insulin on normal and diabetic animals. By excellent team work, in which the previously mentioned investigators and E. C. Noble, J. Hepburn, J. K. Latchford and others participated, it was possible in a comparatively short time to show among other things:

(1) That insulin lowers the blood sugar in normal rabbits; that characteristic symptoms supervene when a certain low level is reached, and that these symptoms are specifically counteracted by glucose.

(2) That it may prevent the hyperglycaemia due to piqure, asphyxia, epinephrin and ether.

(3) That it increases the sugar consumption by the isolated mammalian heart.

(4) That it causes glycogen to be deposited in the liver of diabetic animals fed with sugar.

(5) That it raises the respiratory quotient of diabetic animals fed with sugar.

(6) That it affects the migration of fat in diabetic animals.

(7) That it causes the acetone bodies to disappear from the urine of diabetic animals.

The Dosage of Insulin

A physiological unit of insulin was originally defined as that amount which lowers the percentage of sugar in the blood of a normal rabbit, weighing 2 kg. and starved for twenty-four hours, to 0.045 per cent. within three hours. Because this amount of insulin is said to be greater than that required in the treatment of certain cases of diabetes in man, it has been found advisable to designate as one clinical unit one third of the above physiological unit. This clinical unit has been adopted on the labels of all preparations of insulin manufactured for use in man. In carrying out the actual assays on rabbits considerable variations are found in the extent to which different animals react to equal doses of insulin. It is necessary, therefore, to use many animals for the assay of each sample of insulin, and to take the average of the higher results obtained. Much work is being done using various other animals than the rabbit (mouse, diabetic dog) in an endeavour to improve the method of assay. In large diabetic clinics a valuable assay can be obtained by determining how many extra grammes of carbohydrate can be metabolized per unit of insulin. For this purpose, "pedigree" patients must be used, *i.e.*, patients that have been under observation for a long time, and in whom the carbohydrate balance is precisely known.

The Therapeutic Action of Insulin and its Value in the Treatment of Diabetes

Having found a method for the preparation of insulin in suitable form, it was now possible to test its value in the treatment of diabetes mellitus. This has been done partly in the medical clinic of the University of Toronto, under the direction of Dr. Duncan Graham, and partly in various clinics in the United States. Further investigation on the administration of insulin in diabetic dogs, and in severe cases of diabetes mellitus have shown that the injection of insulin restores to the body this lost ability to oxidize carbohydrates, and glycogen is again stored in the liver. This it evidently does by converting glucose into the active form, and if insulin is given in sufficient quantity and at proper intervals, the blood sugar is maintained at a normal level and the urine remains free of sugar. Fat is also completely burned. As a result of this, acetone bodies disappear from the urine and diabetic acidosis and coma are prevented. In brief, the artificial administration of insulin restores to the body a normal metabolism of carbohydrates, fats and proteins.

Although the administration of insulin is capable of relieving the cardinal symptoms and signs of diabetes mellitus, *one must not conclude that insulin can replace the dietetic treatment of the disease.* In diabetes there is a decreased production of insulin, due to the weakened function of the islands of Langerhans. As all cases of diabetes mellitus are capable of metabolizing a certain amount of carbohydrate, the degree of damage to the islands and their capacity to produce insulin may be ascertained by estimating the tolerance of the patient for carbohydrate. The etiological factor or factors causing this damage to the pancreas have not been discovered. It is known, however, that diets containing excessive quantitites of carbohydrates, or proteins, fats and carbohydrates in improper proportions or quantities, as well as infections, further weaken the function of the already damaged pancreas. The object of treatment should be to give rest to the damaged islands and conserve their power to produce insulin. Before the introduction of insulin this was accomplished best by the dietetic treatment outlined by Allen, Joslin and others. By marked restrictions in diet, combined with periods of fasting, Allen demonstrated that, even in severe cases of diabetes, the urine could be kept free of sugar, and the blood sugar maintained at a normal level for long periods of time. Later, many patients remained aglycosuric without the necessity of fasting. This method of treatment gave a maximum of rest to the damaged pancreas, and allowed it to maintain, or even increase its power to produce insulin. The lives of severe cases of diabetes were definitely prolonged, whereas mild cases regained sufficient tolerance for carbohydrates to allow them to take a more liberal diet and yet remain free of symptoms. Unfortunately, the extreme under-nutrition resulting from the prolonged use of the restricted diet with fasting caused a marked loss of weight and strength and made the continuation of the treatment difficult.

The introduction of insulin in the therapy of diabetes makes it possible to begin the treatment of even severe cases with a palatable diet of protein, fat and carbohydrate in adequate quantities to meet the requirement of the body at rest in bed, or with moderate exercise, and at the same time afford adequate rest to the damaged islands of Langerhans. After the glycosuria and ketonuria have disappeared, and the blood sugar level has returned to normal, the diet may be gradually raised until the patient is receiving sufficient to maintain the body weight slightly below normal, and sufficient calories are being supplied for the body to perform the ordinary duties of life. In some cases the pancreas has so regained its power to produce insulin that the daily dosage need not be increased; in others, where the damage to the pancreas is more permanent, sufficient additional insulin must be given to keep the urine of the patient free of sugar on the increased diet.

Overdosage of insulin is followed by the development of serious signs and symptoms demanding immediate treatment. The patient complains of a sense of weakness and fatigue, associated with sweating, a feeling of tremulousness and sometimes pallor and flushing. In the more severe forms there is acute distress with mental disturbances and even unconsciousness. These reactions are due to a fall in the blood sugar below the normal level of 0.1 per cent. When the blood sugar falls to 0.07 per cent., symptoms develop, and if it falls to 0.035 per cent. the patient becomes unconscious. The symptoms, though alarming both to the patient and those in attendance, are completely relieved if glucose is given immediately.

Indications for the Use of Insulin

The indiscriminate use of insulin in the treatment of diabetes mellitus is a real source of danger. At the beginning of treatment all cases of diabetes mellitus, except those suffering from severe acidosis and coma, should be put to bed and given a basal maintenance diet. This diet contains protein sufficient to replace the daily wear and tear of the tissues of the body, approximately 0.3 gm. per pound of body weight. Additional calories in the food are supplied by carbohydrate and fat in proper proportion to prevent the production of acetone bodies, and in adequate amount from the height, weight and sex of the patient. If the urine of the patient becomes free of sugar on this diet it should be gradually raised until he is receiving an adequate diet for the performance of the ordinary duties of life. Should the patient remain aglycosuric on this diet, insulin treatment is not indicated. Approximately seventy-five per cent. of diabetics may be controlled by dietetic treatment. Some clinicians, however, prefer to use insulin in addition to dietetic treatment in the moderately severe cases.

If, at the end of a week's treatment on a basal diet, the urine is not free of sugar the patient requires insulin. The amount of insulin to be injected daily is dependent upon the total amount of glucose found in the urine at the end of the preliminary period of observation. It is given in divided doses, injected subcutaneously, usually before breakfast and supper or, in more severe cases, before each meal. Under combined dietetic and insulin treatment the patient rapidly improves. As the body is supplied with an adequate amount of insulin, the carbohydrate is properly metabolized; sugar and acetone bodies disappear from the urine, and the blood sugar returns to a normal level. The patient enjoys his food, feels stronger, and the mental depression so characteristic of the severe diabetic is replaced by cheerfulness. Some patients have been able to resume their former occupations after a month's treatment. Further details of clinical experiences with insulin will be found in the articles of Banting, Campbell, Fletcher, Allen, Joslin, Fitz, Geyelin, Wilder, Williams, etc., in the current number of the *Journal of Metabolic Research*.

Probably the most brilliant results obtained with insulin have been in the *treatment of diabetic acidosis and coma.* In these cases insulin must be given immediately. All cases of acidosis and threatened coma react favourably to combined dietetic and insulin treatment. In uncomplicated cases of advanced coma, the majority—four out of six—have recovered after being given repeated intravenous injections of insulin combined with an adequate amount of glucose to prevent the blood sugar from falling to a dangerous level. All the other fatal cases of coma treated had an associated infection sufficiently severe to cause death apart from the diabetic condition.

The susceptibility of the diabetic to infection has long been recognized. The effect of a developing infection or a surgical operation upon the future course of a case of diabetes was feared by the physician. These, combined with acidosis and coma, constituted danger points in the life of the diabetic. If infection develops, or an operation becomes necessary in a case of diabetes adequately controlled by diet, sufficient insulin should be given to keep the urine free from sugar and acetone until the patient recovers. In more severe cases of diabetes already under insulin treatment the daily dose must be increased. Under combined dietetic and insulin treatment diabetics have recovered from mild infections in a normal period of time; teeth have been extracted, tonsils removed, and amputations performed with safety.

Diabetes mellitus can be successfully treated in the less severe form by giving a properly balanced diet; in the more severe, by proper diet and an adequate daily dosage of insulin. The success of treatment is dependent upon the physician for the institution of proper treatment, and upon the patient for the continuation of the treatment prescribed. A prescription of a properly balanced diet is of as much, or even greater importance for a case of diabetes mellitus than is one of drugs in the majority of the diseases the physician is called upon to treat. In the beginning of treatment the value to the patient of the month or six weeks stay in an institution with proper facilities for the investigation and dietetic control of cases of diabetes mellitus cannot be overestimated. The case can be more fully investigated and the effect of an accurate diet carefully controlled. The patient appreciates more readily the value of proper diet in the treatment of his condition, and becomes familiar with the character, amount and preparation of the various foodstuffs constituting his diet. In an institution the tuberculous patient learns how to live; the diabetic, what to eat.

The Manufacture of Insulin

Since the method for the manufacture of insulin from slaughter house material demands the greatest of care and the strict observance of certain principles of extraction, and since it has been found that toxic symptoms are readily caused by excessive dosage, steps have been taken by the University of Toronto to ensure the proper manufacture of insulin, and to provide for some measure of control over its distribution among the medical profession. The history of the various steps is briefly as follows: After it was discovered that an active non-irritating preparation of insulin could be prepared on a small scale by extraction of the pancreas with weak alcohol and then purifying the extract by fractional precipitation with stronger alcohol, attempts were made to expand the scale of productions so as to yield sufficient material for clinical use. Great difficulties were encountered in this work, and for over two months scarcely any insulin could be obtained. When the difficulties were at last overcome and a reliable large scale procedure had been definitely elaborated in detail, the question of publication of the method came to be considered. It was pointed out, however, that such publication of the method would probably result in some commercial firm modifying the process sufficiently so as to obtain a patent which would give them a monopoly in manufacture, and that the only satisfactory way to prevent this was for the chief originators of the method to apply for such patents in their own names and to assign these, when granted, to some non-commercial organization to administer in such a way as to prevent commercial exploitation of the product. Application for process and product patents were, therefore, filed and the Board of Governors of the University of Toronto was requested to accept these patents and to assume responsibility for their administration on the basis, first, that the "patent" is not to be used for the purpose of restricting the preparation of this or similar extracts elsewhere, or by other persons" and second "that the University holds the patent for the sole purpose of preventing any other person from taking out a similar patent, which might restrict the preparation of such extract."

The Board of Governors accepted the trust and appointed a committee composed of Colonel A. E. Gooderham (as Chairman) Sir Robert Falconer, President of the University, Mr. T. A. Russell and Sir Joseph Flavelle, and an advisory committee, the *personnel* of which is as follows: Dr. J. J. R. MacLeod (*secretary*), Dr. F. G. Banting, Mr. C. H. Best, Dr. J. G. Fitzgerald, Dr. R. D. Defries, and Dr. Duncan Graham, with Mr. C. H. Riches, as legal advisor.

One of the first questions to be considered by the committee related to further expansion in the manufacture of insulin. Since, however, a large scale method had not yet been sufficiently evolved to ensure a product of constant potency, it was decided before issuing licenses to manufacturers to develop the details of such a method. At the same time it was realized that adequate facilities for doing this on a practical manufacturing scale could not be provided for unless by collaboration between the committee and some highly organized firm or firms engaged in the manufacture of animal extracts of a similar nature. And since it was also evident that such collaboration could not be carried out satisfactorily with several firms at one and the same time, it was decided after careful consideration to invite the Eli Lilly Co., of Indianapolis, to send representatives to Toronto to confer on the question. As a result of this conference an agreement was entered into whereby the above mentioned firm was granted an exclusive license in the United States for the manufacture of insulin for an experimental period set provisionally at one year, under the following conditions:

1.—That the firm utilize all of its available facilities and personnel for the manufacture of the product and pay all expenses entailed in its large scale manufacture in their plant.

2.—That the firm submit samples of their product to the University of Toronto, for approval before distribution to physicians for use on patients.

3.—That the approved product be distributed either *gratis* or at cost price only to such physicians as may be chosen in consultation with the University of Toronto.

4.—That a certain percentage of the approved product be given *gratis* to the University of Toronto for use in its experimental laboratories, and for clinical purposes in its associated hospitals.

5.—That after the expiry of the experimental period the firm be licensed by the University of Toronto to manufacture the product under the same favourable terms as may be granted to other firms operating in the same territory.

In consideration of the acceptance of these conditions (contained in an agreement between the firm and the University of Toronto signed, May 31st, 1922) all known details of the method of manufacture of insulin were given to the Eli Lilly Co., and work was immediately started by it on a large scale.

Having made these arrangements for a gradual expansion in the manufacture and clinical use of insulin in the United States, the Committee now took up the question of its control along similar lines in Great Britain, and it was decided to apply for patents in that country and to recommend to the Board of Governors that these, when granted, should be assigned to the Medical Research Council of Great Britain on the same general terms as they had been assigned to the University of Toronto, namely, to administer as they deemed best for the purpose of preventing commercial exploitation and uncontrolled manufacture in that country.

During the latter part of 1922, intensive work on the manufacture of insulin, both in Indianapolis and Toronto resulted in the gradual increase of the output, so that it became possible to offer insulin for clinical trial to a large number of physicians whose reports on its therapeutic actions have been of great value in guiding the committee and the manufacturers in questions of suitable dosage, possible risks from overdosage, and the elimination of irritating impurities. This insulin was distributed free of cost by the Eli Lilly Co.

The large expenses incurred by the collaborating firm up to this stage made it necessary for them early in 1923 to put a cost price on their product. With the approval of the Committee of the University of Toronto, the number of collaborating physicians was also increased so that there might be in each large centre of the United States at least one clinic in a position to undertake treatment of emergency cases of diabetes by the use of insulin. Arrangements were also made through the Connaught Laboratories to undertake a similar expansion of distribution in Canada.

Through the whole-hearted collaboration of the University and the Eli Lilly Co., and the valuable assistance of its scientific advisor, Dr. G. H. A. Clowes, a large scale production of insulin has been carried forward at a satisfactory speed, and it is hoped that it will be possible at an early date to terminate the experimental period. That the policy as outlined above has been justified is exemplified by the fact that several firms have exploited for the treatment of diabetes entirely worthless preparations to which they have given names so closely similar to "Insulin" as to convey the impression that they contain the anti-diabetic hormone. While no other harm may come of this than that useless medicine is taken, it indicates that deaths from overdosage might have occurred in practice had the method for the manufacture of potent preparations of Insulin been made available without any control, and without some supervision over its distribution. Under such conditions the market would by now be flooded with preparations of unknown potency and durability, and serious accidents would inevitably have resulted because of overdosage.

The method of gradual expansion in the clinical application of insulin has eliminated the risks of such accidents. That these would certainly have occurred had insulin been made freely available in the profession will be sufficiently clear from the description of its use which is given in a preceding part of this article. Even at the risk of repetition, it should be pointed out that the symptoms of hypoglycaemia due to an overdose of insulin may come on while the patient is asleep, and also that they are sometimes not unlike those of the late stages of many cases of coma. When insulin is used for the treatment of diabetic coma, therefore,—and its value here is unquestioned—the physician must see to it that the blood sugar is not lowered to the level at which hypoglycaemia symptoms supervene. Experience has shown that these symptoms can be recognized at their onset and their development, so that, their occurrence is no longer to be feared as a risk.

It is expected that insulin will be available in general practice within the next few months, and in anticipation of this it is strongly urged by the Insulin Committee that physicians who may desire to employ this useful antidiabetic remedy in practice, should visit some clinic in which it has been in use. This is advisable, not only in order that they may become familiar with questions of dosage, and the treatent of cases showing symptoms of overdosage, but also that they may learn to recognize the type of case it should be prescribed for. It should be remarked in this connection that many, if not most cases of diabetes can be adequately treated by dietetic measures alone, and that the necessity for insulin treatment can be determined only by careful clinical study.

Future policy of the University of Toronto

Now that a satisfactory process has been worked out for the manufacture of insulin on a large scale, the Insulin Committee considers that at the expiration of the temporary agreement with the Eli Lilly Co., licenses to manufacture insulin should be granted to other firms who are able and willing to comply with certain conditions imposed by the Committee. The Lilly Co. agrees to assign to the Committee patents covering certain improvements in the manufacture of insulin, that have been elaborated by them. All information in the possession of the Committee, including the various methods involved in the manufacture of insulin, whether patented or not, will be conveyed by the Committee to the licensed manufacturers, it being understood, however, that they on their part agree to put at the disposal of the Committee any new processes which they may devise, whether patentable or not, and that the Committee may then transmit this information to other manufacturers. In other words, the policy is to be that all patents already applied for and all information concerning the manufacture of insulin will be made available for such manufacturers that satisfy the Insulin Committee that they are in a position to undertake the manufacture of this substance. By this arrangement it is considered that the purposes for which the University of Toronto holds the patent rights will be fulfilled, and that the medical profession will be assured of the most satisfactory product at the lowest cost.

The Insulin Committee desires to express its appreciation of the whole hearted manner in which the Lilly research laboratories have cooperated in working out the problems of large scale production of insulin. Without this collaboration it is unlikely that a non-irritating product of such satisfactory potency and durability could have been produced in adequate amounts to meet the demand of the medical profession, in this comparatively short time.

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Calcareous Degeneration of the Dorsal and Lumbar Aortae as a cause of Backache.—John Ridlon and E. J. Berkheiser, Chicago, state that no examination of a painful back is complete and conclusive without an examination of the circulatory system, and that the treatment of many painful backs ought to be directed by the internist and not by the orthopedist. The routine employment of girdles, braces and plaster jackets and extension in bed should be regarded with skepticism in the treatment of painful backs. Three cases are reported.—*Journal A. M. A.*, June 23, 1923.

DIETETIC TREATMENT IN DIABETES MELLITUS

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IF one surveys the history of the treatment of diabetes mellitus it becomes apparent that successful treatment, of certain patients at least, has been accomplished in seemingly diverse ways. It is now universally admitted that diet, and not drugs, is the mainstay of any successful treatment of this disease. At various times certain articles of food have been stated to have particularly beneficient properties in controlling the affection. These have had their vogue and have been followed by others for which in turn great things were claimed and denied. The points not generally recognized were—the total glucose content of these diets and the individual variations in the tolerance of different patients for these foodstuffs. Any foodstuff may be suitable for certain diabetics but this same substance may prove most harmful to others. For the less severe cases of diabetes mellitus dietetic control alone will effect a considerable improvement in their condition. For a certain proportion of cases no type of dietetic treatment is adequate in controlling the disease. For such patients, fortunately not a large proportion of the whole class, "Insulin" (an extract of pancreatic islet tissue) has been recently introduced into clinical use in conjunction with dietetic treatment. It may be said, however, that there is no case, whatever its severity may be, in which it will ever be advisable to use insulin without due attention to dietetic principles.

Diabetes is a disease in which the body is unable to efficiently metabolize carbohydrate. It has now been proven by the work of Banting* and others that this is due to insufficient insulin production by the pancreas. Insulin is apparently secreted into the blood stream by the Islands of Langerhans. A number of investigators, notably Opie[7], Allen[2] and Conroy[4] have called attention to the degenerative changes which occur in the islet tissue of the pancreas of severe diabetics. In partially depancreatized animals, Allen[1, 2] has demonstrated that functional and anatomical damage to the islet tissue results from overfeeding, thus indicating the necessity in treatment of keeping the work of the pancreas within the limits of its capacity. The severity of diabetes is in direct relation to the patient's tolerance for "total glucose." This may be determined by placing the patient on a known diet and estimating the amount of glucose excreted in the urine. In calculating the total glucose content of the diet it must be remembered that it consists of 58% of the protein and 10% of the fat (the glycerine) as well as the preformed carbohydrate. When the diet is excessive, clinical cases of diabetes show evidence of damage to the pancreas in the reduced tolerance for total glucose which results. Rest to the pancreas must mean a reduction in the total glucose to be metabolized by the pancreas and the object of treatment should be to accomplish this result by suitable dietetic measures with or without the artificial administration of insulin.

Methods of treatment of diabetes having as a basic principle the reduction in the work required of the pancreas have been introduced by Allen[3] and Joslin[5]. Their methods of total dietary restriction and the use of fast days at intervals prolonged the lives of many severe diabetics, and the rest to the pancreas often resulted in an increased output of insulin, the internal secretion, and greater tolerance for total glucose. This permitted of a more liberal diet being used. Though in certain cases of diabetes these methods have served admirably, it is unfortunately true that in other cases the necessary restriction in diet was so severe as to lead to marked under-nutrition. Patients fed insufficiently are partly starved and the body protein and body fat are called upon to make up the minimal number of calories required to sustain life. The under-nourished, severe diabetic is quite unable to perform any useful work and is very subject to infections which may induce a further reduction in tolerance. In the most severe cases the "fasting" treatment actually

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*For a bibliography of Insulin see Macleod, J. J. R.: *Insulin and Diabetes, B.M.J.*, II, Nov., 1922.

defeats itself as the increased production of carbohydrate from body protein makes it impossible to get the patient aglycosuric. It would appear desirable to avoid these extreme degrees of under-nourishment and to furnish the diabetic with a diet sufficient to satisfy his normal caloric requirements. It is apparent that in such a diet the carbohydrate and protein must remain low in amount since each of these require insulin for their combustion. It has been shown by Marsh, Newburgh and Holly[6] that two-thirds of a gram of protein per kilogram of body weight is sufficient to maintain nitrogenous equilibrium provided the requirement for calories is otherwise met. The additional calories of the diet must be derived from fat but the complete combustion of this substance takes place only when sufficient carbohydrate is also being burned. When carbohydrate is markedly restricted from any cause, acetone bodies are produced from fat and in diabetics acidosis and coma may result. Woodyatt[11] has suggested that one molecule of fatty acid may be completely burned while one molecule of glucose is undergoing combustion. Further work by Wilder[9] and Schafer[8] appears to show that under certain conditions as much as two molecules may be burned with one molecule of glucose and no acetone bodies result. The relative efficiency of protein, carbohydrate and the glycerine of the fat in preventing acidosis has been well discussed by Schafer[8]. Plans for the dietetic treatment of diabetes based on the foregoing considerations have been suggested by Woodyatt[12] and by Wilder[10]:

Though in certain cases the ratio of fatty acid to total glucose may be markedly different, Woodyatt[12] believes that in the long run a 1:1 molecular ratio is the most satisfactory. Wilder[10] has introduced a chart for calculating a diabetic diet on a basis of 1.7 molecules of fatty acid to 1 molecule of glucose in the food (ketogenic antiketogenic ratio 1.7:1). Both these methods have a definite value in the treatment of diabetes mellitus. Some experience with the 1:1 molecular ratio made it apparent that too high carbohydrate tolerance was required to make it suitable for the majority of diabetics though more palatable diets might be constructed with it. The disadvantage of the Wilder ratio is that a large percentage of patients do not need it, that the ratio of carbohydrate to fat is very low, the choice of foodstuffs is thereby restricted and patients soon become tired of the monotonous diet. Of course some patients are encountered who will become aglycosuric only when on such a diet as Wilder's. But for the average patient a somewhat less drastic restriction is desirable. Only those who have seen it will appreciate the great difference a few grams of carbohydrate makes to these patients.

While recognizing the usefulness of varying the ratio of fat and total glucose in the diet in certain cases from any arbitrary standard, it seemed desirable to follow a method which would, to some extent, avoid these difficulties. After trial, a molecular ratio of fatty acid to total glucose of 1.3 to 1 was adopted as being more generally suitable. The method to be described has been tried out during the past two years in the Toronto General Hospital. It has proved of particular service in connection with the insulin treatment of diabetes. It is now felt that such patients as are unable to remain aglycosuric and at normal blood sugar levels on this diet should be given insulin in suitable amount to accomplish this object.

Table I

Surface Area Chart (Du Bois)

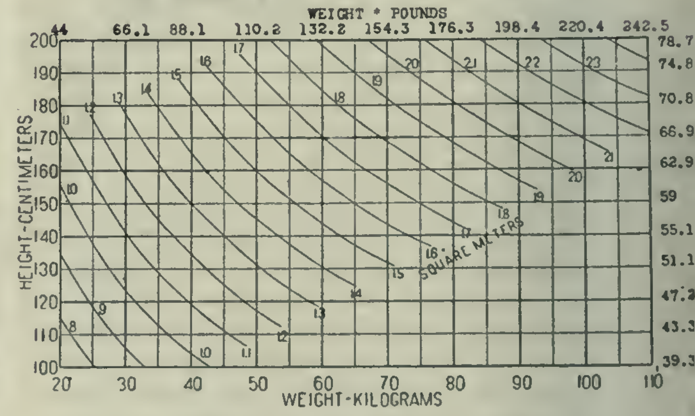

Chart for determining surface area in man in square metres. Example: Weight 154.3 lb., Height 70.8 in. = 1.88 sq. m.

Table II

Caloric Requirement per square metre of body surface (Aub-Du Bois)

Age	Males		Females	
	Cal. per		Cal per	
Years	Hour	Day	Hour	Day
10-12	51.5	1236	50	1,200
12-14	50	1200	46.5	1,116
14-16	46	1104	43	1,032
16-18	43	1032	40	960
18-20	41	984	38	912
20-30	39.5	948	37	888
30-40	39.5	948	36.5	876
40-50	38.5	924	36	864
50-60	37.5	900	35	840
60-70	36.5	876	34	816

The plan of procedure is to ascertain the normal basal caloric requirement for their age, height, weight and sex, and construct a diet with particular reference to the principles discussed above. The diet is calculated as follows:

(1) The patient is weighed and his height measured.

(2) From Du Bois' Table (Table I) the surface area of the patient is obtained, and this when multiplied by the 24 hr. basal requirement in calories for the patient's age and sex (Table II, Aub and Du Bois) gives the normal basal caloric requirement for a patient at rest.

(3) If the weight is obtained in pounds, inspection of Table I gives the equivalent in kilograms directly, and this latter figure times two-thirds, gives the number of grams of protein required.

(4) The basal caloric requirement (M) divided by 30, minus $\frac{1}{3}$ the protein in grams or, more simply, $C=\frac{M-10P}{30}$ gives the number of grams of carbohydrate required.

(5) Fat sufficient to make up the calories required is supplied by the formula, $F=\frac{M}{10}-\frac{P}{2}$.

Example: A diet is to be constructed for a man of 55 years, height 5 ft. 7 in., weight 132 lbs. or 60 kgms.

Inspection of Table I shows a surface area of 1.7 sq. m. From Table II: $900\times1.7=1530$, the number of calories required per day (M).

The protein required $=60\times\frac{2}{3}=40$ gms. per day

The carbohydrate, $C=\frac{1530-400}{30}=37.6$ gm.

Fat $=\frac{1530}{10}-\frac{40}{2}=133$ gms.

With the composition of the diet in terms of the weight in grams of protein, fat and carbohydrate required it is a comparatively easy matter to construct a suitable diet from food tables*. On such a diet, provided he is kept at rest, the patient in the majority of cases will become sugar free, though this is not usually accomplished as rapidly as in the starvation method. Acetonuria is also controlled but somewhat more slowly than by Allen's method. The advantage of the method consists in the increased comfort of the patient and the fact that, subsequent to getting the patient aglycosuric by the Allen method, a considerable period is required to determine the patient's tolerance. On this account the total period of treatment is actually shorter than the starvation method.

While the patient is in bed or confined to his room a diet equivalent to his normal basal requirement is sufficient. With greater activity a larger diet is required. Before any such increase is advised it is well to estimate the fasting blood sugar. Values of 0.13% or over would seem to contraindicate such an increase, as patients with high blood sugar ultimately do badly. In most cases with a low blood sugar increase in the number of calories is the first object to be attained, and it is found that the addition of 5 gms. of carbohydrates and 20 gms. of fat, yielding 200 calories is a satisfactory method of increase as it provides a maximal number of calories without inducing ketosis. If this addition is well borne over a period of a week or more, a second and third increase in diet may be allowed, thus raising the food 600 calories above the basal requirement and restoring the patient to something like his old vigour. The ketogenic antiketogenic ratio of these additions to the diet is 1.7:1, somewhat higher than the original ketogenic antiketogenic ratio adopted for getting the patient sugar free but not higher than that based on Wilder's diet formula and quite safe so long as increases are small compared with the basal requirement.

Up to this time no additional protein has been used for three reasons: (1) it increases metabolism by its high specific dynamic action; (2) it is not as efficient an antiketogenic agent as carbohydrate; (3) the need for calories is greater. The diet at this point, though, is becoming somewhat top-heavy with fat and this means lack of variety in the menu. Variety can be provided by increasing the protein at this stage. It is thought that 8 gms. of protein has about the same power to cause hyperglycaemia as 5 gms. of carbohydrate, and consequently this amount of protein plus 10 gms. of fat is added to the diet. The ketogenic antiketogenic ratio is 1.7:1, calories, 122.

At this point a word of caution is worth while. The patient is now receiving 2,252 calories, or 722 calories (40-50%) above his basal requirement—sufficient for the performance of light work. It is the common experience that excessive work or excessive food intake ultimately results in reduction of the patient's tolerance for glucose and it is well to consider whether the increase in diet should not stop at this point. The activities of the patient do not require additional protein and it is believed that further increases in the diet should not be made unless the fasting blood sugar is normal.

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*Reference may be made to Atwater and Bryant—*Bull. 28, U.S. Dept. Agric., The Chemical Composition of American Food Materials;* Joslin—*The Treatment of Diabetes Mellitus;* Locke—*Food Values;* Friedenwald and Ruhrah—*Diet in Health and Disease;* etc.

The importance of maintaining low blood sugar levels in diabetes has never been overestimated and was never so clearly demonstrated as now. At the present time there is a tendency even under insulin treatment to neglect this important factor in the belief that increased insulin will take care of any further loss of tolerance which may develop. Nothing could be more fallacious. The greater the severity of the case, the nearer it approaches complete diabetes, the greater the difficulty of properly regulating the dosage of insulin and the time of its administration, the greater the number of hypoglycaemic reactions encountered and the oftener the appearance of high blood sugar and glycosuria. In my experience and that of many others, it is unwise, considered from the standpoint of the ultimate result in treatment, to be satisfied with fasting blood sugar levels of more than 0.13%.

The application of the principles of dietetic treatment discussed above may be illustrated by briefly reporting the following two cases:

Case I.—H. G., aet. 32, motorman. Admitted, October 16th, 1922; discharged, December 26th, 1922. Best weight, 156 lbs.; weight at onset, 145 lbs.; weight on admission, 119 lbs. Height, 5′ 8¾″. Surface area, 1.65 sq.m. Basal caloric requirement, 1,564 calories.

Present Illness.—On May 1st, 1922, complained of headache, dryness of the mouth, thirst and polyuria. On May 15th, sugar was found in the urine. He was placed on starvation treatment. He became sugar free; then was placed on a vegetable diet and gradually other foods were allowed. Has been losing weight, becoming progressively weaker and is now unable to become sugar free on starvation.

Past Illnesses.—Measles at 3 yrs.; whooping cough at 6 yrs.; trench fever, 1916-17.

Family History.—Negative for diabetes and obesity.

Examination.—Well developed, poorly nourished, adult male. Skin and hair dry and harsh. Knee jerks absent and three carious teeth. Otherwise nothing abnormal found in physical examination. On admission he was excreting 50 gms. glucose and 10 gms. acetone bodies.

Treatment.—The patient was required to rest at first. Later the amount of exercise was gradually increased. He was placed on a diet of protein 35 gms., fat 139 gms., carbohydrate 40 gms., calories 1,551. During the first few days of treatment he excreted approximately 30 gms. of glucose and 5-11 gms. of acetone bodies. By October 25th, the sugar excretion had fallen to 5 gms. and the acetone bodies to 1.25 gms. October 30th, the sugar excreted was 1.7 gms., and acetone bodies, .3 gms. November 2nd, and continuously thereafter, he has been aglycosuric and the Rothera test has shown only the occasional trace of acetone bodies. The blood sugar levels showed gradual improvement—October 17th, 0.227%; 23rd, 0.174%; 27th, 0.190%; 31st, 0.137%; November 3rd, 0.157%; 7th, 0.120%, 14th, 0.130%; 18th, 0.156%; 21st, 0.118%; 24th; 0.143%; 28th, 0.124%. During this time he gained 7¾ lbs. in weight. After 44 days on the basal maintenance diet, the food intake was increased to protein 35 gms., fat 159 gms., carbo hydrate 45 gms., calories 1,751. The blood sugar continued to remain low, being on December 1st, 0.105%; 6th, 0.110%; 7th, 0.120%; 14th, 0.095%. December 16th, 18 days later, a further addition of 200 calories was made to his diet, raising the intake to 1,951 calories. Two subsequent blood sugar tests showed values of 0.105% and 0.103% respectively, and the patient was discharged on December 26th, having gained 12¾ lbs. After the first few days in hospital the patient commenced to increase his activities and to ask for work to do. Before he left he declared that he was doing more work than was required of a motorman, and desiring more to do. Patient on March 19th weighed 141 lbs.; had been continuously aglycosuric and felt more than competent to do all the work required of him. His blood sugar was 0.112%. Were it not that he is increasing in weight on his present diet a further raise in diet might safely be allowed but in view of this fact it has been thought advisable to allow as much rest to the pancreas as possible.

Case II.—F. D. H., lawyer, age 52. Height, 5′9″. Weight on admission, 137 lbs.; best weight, 195 lbs. Surface area, 1.75 sq.m. Basal caloric requirement, 1,575 calories. Admitted to hospital, December 20th, 1922; discharged, February 12th, 1923.

Present Illness.—Became weak and polyuria developed three years ago. Glycosuria was discovered and he was placed on dietetic treatment. As improvement was not marked he went to a "sanitarium" for several months where he lived on a semi-restricted diet. His general health improved; he felt stronger, put on weight and was sugar free in several morning specimens of urine tested. He probably was not completely aglycosuric throughout the day. After discharge, he gradually lost weight and became discouraged, despondent and "too weak to drag himself around," and reported for treatment.

Past illnesses.—Children's diseases.

Family history.—Negative for diabetes and obesity.

Physical examination.—Revealed no abnormalities except marked loss of weight and muscle tone.

Treatment.—On admission he showed a moderate degree of glycosuria without acetonuria. Blood sugar, 0.195%. He was placed on a basal diet of protein 41 gms., fat 138 gms., carbohydrates 39 gms., calories 1,572. He became sugar free at once, and the blood sugar fell to 0.129%. On January 3rd, weeks two after admission, the blood sugar was 0.116%, and 200 calories were added to the diet in the form of 5 gms. of carbohydrates and 20 gms. of fat. January 13th, the patient had been continuously aglycosuric and the blood sugar was still 0.117%. 10 gms. of carbohydrates and 8 gms. of protein were given to assist in stopping the slight acetonuria which developed. This proved effective. The patient remained sugar free, but the blood sugar rose slightly to 0.122%. In spite of this the diet was raised on January 27th to protein 49 gms., fat 200 gms., carbohydrates 65 gms., calories 2,256. The blood sugar rose to 0.140%. The ratio of ketogenic to antiketogenic substances in this diet is as 1.26:1, a safe level as is shown by only minimal traces of acetone bodies appearing in the urine occasionally. The diet remained the same and the fasting blood sugar level fell to 0.12% on the day of discharge. During the first eight days of treatment the patient lost 5 lbs., but regained this before discharge.

The mental change in this patient was quite remarkable. As he became stronger his despondency disappeared and he became interested in things apart from himself. Within a few days he was demanding more food for his increasing energies. On discharge he was getting a diet of 2,253 calories or 681 calories (43%) above his basal caloric requirement. This provided him with all the energy he required and, in fact, he regained his lost weight on it. He was discharged feeling well and able to take long walks without fatigue.

Discussion

These cases were selected from among a number of patients treated by this diet. The first case illustrates the comparatively slow response to dietetic treatment not uncommonly seen in these patients. Attention may be drawn to the plan of increasing the diet slowly as the period of relative rest to the pancreas is probably of value in promoting increase in tolerance for glucose. The second patient responded to dietetic treatment more rapidly because of a greater remaining tolerance for total glucose. The diet was increased comparatively slowly and he showed a satisfactory increase in his ability to utilize carbohydrate.

It should not be forgotten that the most satisfactory results are to be obtained when the food taken is digested and absorbed. As pointed out by Woodyatt[12] it is the metabolizing mixture of fats and glucose in the body tissues which determines the presence or absence of ketosis and this is borne out by clinical experience in the treatment of cases given improperly constructed diets in which marked disparity between the glucose and fatty acid obtained. With the damage to the islet tissue of the pancreas there may be, and in severe cases often is, damage to the acinar tissue with deficiency of the external secretion of the pancreas resulting in imperfect digestion of foodstuffs, and a totally different mixture being metabolized than is being fed. This possibility should not be lost sight of in the search for a cause of ketonuria in a case under treatment. In the more severe diabetics a morning ketonuria may be noted which disappears after 10-11 o'clock when the carbohydrate taken at breakfast is being metabolized. This ketonuria is never very serious but serves to remind us of the preferential utilization of carbohydrate over fat when both are available for energy production. It can sometimes be controlled by feeding a portion of the carbohydrate late in the evening. This procedure should be used with caution, however, since increase in the number of meals apparently increases the carbohydrate tolerance and one may be tempted to increase the patient's caloric intake in this way. Many devices such as, increased number of meals, small amounts of carbohydrate given an hour before the meals and active exercise after meals have been employed to increase the carbohydrate tolerance. The improvement is more apparent than real, and is but temporary in nature. They cause a stimulation of the pancreas and more insulin is produced but the increased work injures the pancreas and ultimately lowers the tolerance of the patient for glucose.

When patients have passed through a period of undernutrition due to their disease or their previous treatment they very readily gain in weight when placed on a suitable diet. The diet here suggested is not actually the basal requirement of the patient but his calculated requirement under normal conditions. In reality, severe diabetics, free from acidosis and on diets low in protein so that the specific dynamic action is low, have basal metabolic rates of 70-90% of the normal; and this explains why patients placed upon such basal caloric diets actually gain in weight when they are relatively inactive. Within limits this increase in weight is desirable but it should not be forgotten that increased weight means increased caloric requirement and increased work for the pancreas. In the more severe cases it is felt that it is advisable to allow them to gain up to within 10-15% of the average weight for their height and age. This is within the normal variation and should provide a measure of protection against infection. The overweight diabetic is advised to reduce in weight as his tolerance will improve by so doing. This may be done by keeping him on a basal maintenance diet and gradually increasing the work he is doing, or by supplying protein and carbohydrate as per formula and limiting the fat. If this is done care must be taken to avoid over-fatigue and should evidence of acidosis develop it should receive prompt attention.

It is well known that diabetics are more subject to infections than other individuals, and these tend to run a more severe, more prolonged course than in other people. The toxic condition induced by the infection causes a loss of tolerance for carbohydrate which may be either temporary or permanent. Much may be done to combat the infection by placing the patient on a suitable diet. Adequate surgical treatment of infections often involves operation and this was formerly attended by a very high mortality in the diabetic. Dietetic treatment of these patients improves the operative risk. It is now felt, however, that most satisfactory results are obtained with an adequate diet containing considerable extra carbohydrate and sufficient insulin to maintain the patient aglycosuric with a normal blood sugar level. Local, spinal or gas oxygen anaesthesia are the preferable methods. Chloroform should never be used as there is grave danger of severe liver damage and coma resulting in diabetic patients unable to store glycogen.

Institutional treatment of diabetes has not received much attention in Canada, partly because of lack of adequate facilities and partly because of the apathetic attitude of some practitioners who vainly imagine that they can get just as good results under home treatment. In all cases it is advisable to institute treatment in a hospital where accurate examinations may be made, where food may be properly selected, cooked and served, where the patient may be trained in dietetics as applied to their disease, the measurement of food, the testing of the urine, etc. There is, of course, no necessity in most cases for a prolonged stay in hospital as a period of three weeks to a month is sufficient to get the patient properly started; he then may be treated as an ambulant case. The additional value to the patient repays the cost many times over and to the physician it often means the difference between satisfaction and disappointment in the treatment of the case.

SUMMARY

The principles underlying the dietetic treatment of diabetes mellitus are discussed. These are equally applicable to the treatment of diabetics with insulin and it is emphasized that without attention to proper dietetic regimes insulin is capable of much harm. For the patient who can live on a properly balanced, adequate diet, insulin is available to protect him from emergencies arising in his disease. Types of diets are discussed and a simple method of calculating a standard diet for diabetics is suggested, together with its application in treatment.

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DIAGNOSTIC NOTES IN OBSTETRICS AND GYNECOLOGY*

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MY purpose to-night is to present to you some diagnostic notes; to formulate a few rules, or maxims, based on my own experience. Many of these are old, and very few of them will be new to you. These rules or maxims have been tried in many an anxious furnace, and in the main they have been found, "not wanting." One's clinical life is really a great interrogation point—a passing from one question to another; and in each and every case, a decision must be reached—the answer, yea or nay, to surgical intervention. Health, and life itself depend upon this answer; it is an anxious business.

The peritoneal cavity is the greatest lymphatic space, and, with its bowel content, it presents the largest absorptive surface in the body, both serous and mucosal. In the female, this cavity is not closed, for the bifid genital tract communicates directly between this cavity and the external surface, the outside world. And this outside world is the contaminated world of the vulva and the perineum. This genital tract, moreover, is subject to many vicissitudes; there are the demands of menstruation and of pregnancy, the various traumata of labour, and it is specially exposed to infection, both venereal and pyogenic. Not for nothing has it been written, "one night with Venus, and three years with Mercury." Or, again, given a woman with a chronic gonorrhoeal salpingitis, in common mercy cast her from a steep place to the sea. The uterus, of all the organs in the body, is the commonest site of neoplasm; and the ovary runs it a close second.

So this lower pole of the abdomen lives a strenuous life, is subject to a varied experience.

I shall now enumerate some general rules or maxims, which I have found reliable, and of great assistance. The following are these maxims:

(1) The most common tumour in the lower abdomen, in the adult woman, is a pregnant uterus. The next most common is the uterine fibroid, and the next, an ovarian cyst. As regards menstruation, the first stops it altogether (amenorrhoea); the second increases it (menorrhagia); and the third in no way depraves it.

(2) In any pregnancy, actual or presumed, ask, and keep asking, this question: Does the size of the uterus correspond to the period of amenorrhoea?

(3) Make always, and in each and every case, a rectal examination, either directly, or indirectly, from the vagina.

(4) Ever watch the urinary bladder for retention; and especially, after labour, or surgical intervention. "Has the patient passed her water, and in sufficient quantity?" Repeated dribblets may mean mere overflow. Failure to pass water, early in pregnancy, suggests a pressure retention by a gravid uterus that is retroflexed; while such a failure late in the pregnancy may mean a toxic suppression. In any case of doubt, pass a catheter.

(5) The three stages of labour:

The first, most trying to the physician;
The second, most trying to the child;
The third, most trying (critical) to the mother.

Never hurry the first or third stage. Post-partum haemorrhage is more often the fault of the too-impatient physician than of the too-patient uterus. The third stage is a miniature labour. Keep your eye off the clock, for the uterus itself is the only trustworthy timepiece. Let the placenta wait for the recovery of this uterus; its second wind, as evidenced by regular and strong contractions.

(6) If in the hands of an experienced operator, a second operation has not relieved any given condition, further operation is useless.

(7) A pain in the right side does not necessarily mean appendicitis; and when a patient turns easily and readily upon her side, there is no acute lesion in her abdomen.

(8) The acute appendix—its reliable syndrome. (a) Pain first felt in the epigastrium, and later in the right lower quadrant; (b) Nausea, in greater or less degree; (c) Tenderness over the appendix region (McBurney's point) which, be it

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*Montreal Medico-Chirurgical Society, March 17th, 1922 remembered, is at the base of the mesentery; (d) Muscular spasm or rigidity in the right rectus, and oblique muscles. Fever, an increased pulse rate, or a leucocytosis, may be somewhat conspicuous by their absence.

(9) Inspect always the vulvo-vagina, for signs of a gonorrhoeal infection; it is an imperfect world. In the married woman, make always a vaginal examination—a bimanual. Pus in the urethra, pouting tubules of Skene, or the gonorrhoeaica maculae, at the Bartholinian ducts, may furnish the clue to the acute abdominal condition, to even diaphragmatic pain or rigidity. While a uterus, somewhat immobile, "set in starch," where movement of the cervix causes pain, and where one or more tubes are enlarged, sensitive, and fixed, may clinch this diagnosis. With such gonorrhoeal findings, the acute condition is a tubo-peritonitis, often an exacerbation of an old infection.

In such a case it is wise to disregard even the appendix-syndrome, for the chances are strongly against appendicitis. In these acute gonorrhoeal conditions it is a surgical disaster to open the abdomen. Instead, it is good practice to watch and wait, hour by hour, and not day by day.

(10) In the child-bearing period, a sudden seizure of knife-like pain in the lower abdomen, a feeling of faintness, and a slight uterine haemorrhage bespeak a ruptured ectopic pregnancy, and this quite irrespective of the history. The cataclysmic case, with the large haemorrhage, is easy, and he who runs may read. A number of less severe attacks indicate the chronic case, "the leaker" and here one may often neither run nor read. Examine here for the mass lateral to the uterus, and, in doubt, perform an exploratory colpotomy.

(11) The uterine curette—do not abuse it.

(a) Never curette the uterus as a routine; (a routine part of a larger operation).

(b) Never curette the uterus, save it be freely movable, and there be no adnexal disease.

(c) Never curette the septic uterus.

The indications for the use of the curette are best expressed in the words of Clifford Allbutt: "Curette only the 'running' uterus." Like the catarrhal nose it is "running" all the time, only here, it is an alternate white and red discharge. In scientific phrase, this means a sequence of a menorrhagia and a leucorrhoea.

(12) A uterine abortion may be threatened or inevitable. In the presence of three finds, (a) uterine pains, (b) uterine haemorrhage, and (c) a dilated and dilating cervical canal, it is inevitable. This is the clinical trinity, and if only two are present, the abortion is still but threatened.

(13) In a septic uterus there is no place for local treatment. Posture the patient to secure good drainage. If a portion of placenta be suspected, explore the uterus gently with the finger, and if a cotyledon be found, gently detach, and remove it with forceps. Do not curette, or give an intrauterine douche. While fever persists, even a vaginal douche is contraindicated.

(14) In the pernicious vomiting of pregnancy, make the pulse-rate your guide as to interference. If the pulse-rate rise to 100, and continue thereat for twenty-four hours, it is wise to interrupt the pregnancy.

(15) Pain is the greatest liar in our clinical world. Never open the abdomen for pain only. The tongue may lie, the facies never. Among these essential truths that the face enunciates are:

(a) The waxy, pallid face of a concealed haemorrhage;

(b) The ashen face of shock, and

(c) The dusky cyanosis of an acute infection.

We are all agreed that laziness is the one unforgivable clinical sin, and that well-directed, patient, and painstaking observation is the greatest clinical virtue. Clinical wisdom is a matter both of intuition and of experience, and it is always of slow attainment. Intuition is a gift possessed perhaps by the few; but painstaking observation is within the power of any man.

The Antithesis of Urogenital Tuberculosis in a Tabetic Patient.—Victor F. Marshall and Guy W. Carlson, Appleton, Wis., report a case of tuberculosis of the bladder in a patient affected with tabes. A search through the files of the Surgeon General's Index Catalogue failed, they say, to disclose a report of a similar case. —*Journal A. M. A.*, June 23, 1923.

SOME ASPECTS OF THE PSYCHONEUROSES*

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IN opening a discussion upon the psychoneuroses, I realize, sadly, how little I have to offer that may be viewed in the light of new thought. It is not, indeed, that there is a dearth of new and brilliant ideas upon this subject nor that these ideas have remained dormant in the minds of their creators for, everywhere, the literature abounds in their expression, but rather because of a fear that, in following the allurements of the unblazed trail, we may miss the main road.

To him, who may have followed this trail far into the intricate windings of the newer Freudian thought, to the inevitable exclusion of broader and perhaps saner considerations, and to the ardent disciple of the doctrine of Babinski, I fully realize how lifeless and commonplace my remarks must appear. And yet, if a consideration of some of the broader principles that underlie the causation of the neuroses, will serve, in any way, to bring renewed zeal to the guidance of this unfortunate element in every society, may not one find one's own justification in dealing with these, alone. The past decade has been marked by great advance in the conception of functional disease but it is to the great war, just passed, that we can attribute the revolutionary conception that has taken place in this domain of medicine. True, many workers long before 1914, were striving to give to functional disease a place in the sun, but it is safe to state that a study of the vast army of psychoneurotics, incident upon the late war, has served to advance the ideas of the general profession by many years. The teaching of medicine in the past and particularly in our own schools, has been essentially materialistic. Any conclusion or conception that lacked the support of the microscope or test tube or was not supported by some time-honoured procedure of examination was conveniently relegated to the discard. Such disabilities or mal-functions as could not be based on some evident organic change in the structural make-up of the organism, simply did not exist. The result was that the average student of medicine could prepare a passible thesis on the function of the individual organ,—he could discuss at length the myogenic as opposed to the neurogenic theories of the heart action but never realized or learned that either, or both, of these functions were, in any sense, dependent upon emotional or psychic stability. To him vomiting and gastric pain bespoke the presence of stomach ulcer or cancer, in the absence, of course, of the physiological vomiting of pregnancy, little realizing the importance of the psychic in the pathogenesis of such disorders. He becomes a specialist on the various parts of the machine, each of which he views from the necessarily narrow field of the specialist, while the co-ordinated working of the machine as a whole, the constant change in adaptation of that machine to an ever changing environment—in short the psychic control—entirely escaped his field of vision.

When, however, that change of environment became very marked and very sudden; when conditions fluctuated to wide extremes, such as prevailed under war conditions; when the reaction to that sudden change proved inadequate and the machine broke down; when he could no longer accuse any organ or group of organs of inadequacy, he began to focus his attention upon the control and co-ordination of all these organic functions—in short, to study the mental makeup of the organism.

Although war service conditions have materially altered our viewpoint and undoubtedly advanced our ideas as regards the psychonourosis, we are to-day less concerned with that phase of functional disease than we are with the wide incidence, far too wide, amongst our civilian people.

One hears from time to time that this class of patient belongs essentially to the specialist; on the one hand, to the psychiatrist; on the other to the neurologist, and that no one else has the time or the inclination to bother with them. The truth is that they belong to and come more under the influence of the general practitioner. He it is who first sees the patient, who knows best his environmental conditions, his constitutional and mental makeup since childhood and who is, above all, best fitted to, and I believe more often does, render the helping hand as the first obstacles in the race of life are encountered. Of course, if these obstacles are too closely placed; if they are too severe, and above all if the runner is constitutionally too ill-conditioned for the race, they soon become institutional cases but until such a stage is reached, and many never reach it, these unfortunates must continue to look for and will, I believe, receive help from, the general practitioner of medicine. It is, then, most unfortunate that almost all the armamentarium for dealing with these cases, must be built up from the physician's personal experience alone.

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*Read at the Montreal Medico-Chirurgical Society, Feb. 23rd, 1923

It is to be deplored that the psychoneuroses receive so little consideration in the curriculum of our present-day medical schools and if one were to seek a reason for such a state I believe the greatest factor in that reason would be found to arise from the wide-spread belief that after all nothing can be done for those people—the student discussing a case of hysteria or neurasthenia is observed to clothe his ignorance of the case in the remarking "nothing can be done," "there is no treatment"—the nurse in the ward is heard to whisper to her associate, "only a neurasthenic." And yet there is no group of cases, certainly of the chronic cases, that lends itself more readily to rational treatment or responds more satisfactorily than this very group of cases.

What, then, are the factors which underlie the pathogenesis of the neuroses?

From the days of Charcot, who first seriously considered the neurotic personality, opinion has fluctuated between the organic and the psychic, and even to-day these two fields of thought claim their respective adherents; some stoutly maintaining that the manifestations of the neurotic personality are solely the expression of perverted thought processes; others, that underlying these outward manifestations may be found organic disease processes, were we only able to discover them. The truth will probably be found to fall midway between these two extreme viewpoints. Certainly, we do know that all the symptomology of the psychoneuroses will follow upon organic disease, while, on the other hand, I think we can just as surely state that many are purely psychogenic in origin.

We must, at the outset, view the situation from the standpoint of the personality. Given the normal personality, is it possible to acquire a psychoneurosis? The answer must be, yes; and in this concession we admit at once the influence of the environment.

The term, environment, is a broad one and must include all obstacles with which the individual must contend in his endeavour to live to the best of his ability. It must include:

(1) All organic obstacles such as eye strain, focal infections, chronic disease processes, etc.;

(2) Secondly, it includes mode of life, the ever increasing social and business strain that present day life imposes on him who would run the gamut of existence safely and successfully; and more particularly does it include the apparently small but continuous pricks of unsuitable or incompatible marriage.

The man who comes home to dinner and buries his face in the evening paper, nodding consent or the reverse to the apparently futile but, withal, well meant propositions of his spouse, is sowing in her the seed for a future psychoneurosis. The woman who habitually reminds her husband that her neighbour wears better clothes, rides in finer cars and attends nicer clubs is paving the way for a psychoneurosis. When, finally, we have within recent years developed to an alarming extent the neurosis associated with business and occupational existence. Modern social legislation has imposed on the employer of labour, a responsibility which not only the immediate employer but every individual in the social fabric is forced to shoulder. This legislation has aimed to give justice to the employee who has developed organic injury or disease as a result of his employment, and for this reason, is worthy of sympathy and support; but in the field of the psychoneuroses, we find ourselves confronted with a very real evil. In that field, such legislation often presents the necessary stimulus for the production and perpetuation of functional disease.

One is at once struck with the similarity between this group and that of war origin, especially the type of neurosis one finds to-day as a result of war service. In both of these groups we have the necessary conditions for the perpetuation of the symptoms in the form of compensation on the one hand and of pension on the other. It is in this group the traumatic neuroses and the late war neuroses, more descriptively called pension neuroses, that one sees the purely psychic mechanism at its best. No group is more evidently free of organic basis. Here we have in full evidence that type of the neuroses known as hysteria.

Though all authorities are in accord with the opinion that hysteria is purely a mental disorder, that is, psychic in origin, there is considerable disagreement as to the mechanicism underlying its manifestations. *Charcot*, the father *of special study in hysteria*, gives us merely a descriptive conception. He looked upon hysteria as a disease entity but so far as I am aware, offered no mechanistic explanation. *Janet*, first opened up the *theory of the subconscious* which meant to him, the breaking away or dissociation of a special group of ideas from the main grouping which constitutes the total personality. This meant a narrowing of the field of consciousness. The mechanism by which this smaller group becomes separated was not suggested.

Freud saw in the subconscious, a storehouse of repressed or forgotten experiences which, by reason of their painful affect and consequent inacceptance to the personality as a whole, were relegated to a submental domain, there to work out their own devastating ends. Unfortunately, his colouring of these painful affect complexes was one of sex and sex only, a dogma which cannot withstand withering criticism in the light of our war experience.

And then *Babinski sees the whole mechanism of hysteria develop upon the basis of suggestion.* The bodily defect is in some way or other suggested to the individual and immediately becomes a part of the individual; moreover, such defect produced by suggestion is curable by persuasion,—a form of psychic treatment. If such cure cannot be effected through efficient persuasion, he states the condition is not hysterical, but must either have some organic basis, or be classed as malingering. I fear that even Babinski would find difficulty in establishing his diagnoses in these post-war and traumatic cases if he depended upon the result and permanency of his cure, so long as pension or litigation proceedings were in abeyance.

All of these theories are interesting and each, no doubt, has much to commend it while on the other hand, not one of them is of common application. There is, however, one common factor that pervades and characterizes this group of the neuroses and that is the presence of a motive, concealed or apparent, but always directly antagonistic to the higher moral tenets. I am not prepared to say that this motive is always apparent to the hysteric; often, I believe it is not and as we descend the scale of mental fibre, reaching the level of the submental personality, it is the less liable to be apparent. The mental defective, by reason of his poverty of mental perception and education is less able to present to himself the criticism necessary for its destruction.

In the degree to which this motive is concealed or apparent do we divide our hysterics from our malingerers and here again it is a most difficult decision to make. In any case whether the line be discovered or not, I am convinced that at some period of its existence, this motive rides serenely down the stream of consciousness and there is little to be discerned between the two.

Such, then, are some of the environmental obstacles with which the personality must contend. Every individual meets, and disposes of or succumbs to some or other of these in his course through life. They are common to all. With them the organism must react and the result of that reaction depends not only upon the severity of the obstacle but, also, upon the mental make-up and education of the individual. It resolves into a mental conflict, the solution of which is often the development of a psycho-neurosis.

What, then, of the personality? It has always been a common observation that the harbourer of hysterical manifestations was of inferior mental make-up. He shied at the obstacles and especially so, if he could foresee any temporary advantage by so doing. The fact that he must strain his moral code in order to evade the obstacle meant little to him for after all, his moral sense was not difficult to override and here we note the essential characteristic of the hysteric—a weakened sense of moral. To him, the statement —"I would rather be right than be president" constitutes so many meaningless words. He may be regarded as essentially deficient in moral and aesthetic qualitites of character. This moral deficiency, the ground work of the hysterical tendency is shown in figures produced in the U.S. Army selection draft. Of the soldiers who manifested some hysterical defect prior to enlistment, over seventy-five per cent. were of neuropathic heredity, while of those showing hysterical defects for the first time during service, over fifty per cent. were of neuropathic heredity.

It is evident that we are dealing with an organism, primarily weakened by reason of neuropathic constitution, which can but illy serve the organism in its conflict with the obstacles of life. In such an organism the conflict is short, the moral support is small and the ever present instinct of self-preservation, lacking the control of education and sound moral sense, assumes the superior position. The easier way is the development of a neurosis which now becomes the only means of defense.

We can then regard the psychoneurosis as an adaptative reaction of the neuropathic nervous system. It is a defensive and protective mechanism which springs into activity just so soon as the organism becomes endangered. It is the automatic defense of the nervous system which enables the individual to side-step the present difficulty and to permit of his remaining in the race, under easier and less harassing conditions. Society, to-day places upon the mentally and physically strong a heavy burden. Their handicap would appear to be overwhelming, while on the neuropathic individual the load is reduced to a minimum. Everywhere we find societies and real or fancied benefactors ready to open the gate to the easier way. The course is levelled off, obstacles removed and in many cases carriages provided so that no effort is necessary on the part of the weaker brother. Why not then accept what is offered so long as it can be done within the bounds of decency and self respect, be that quality ever so small. Moreover, if he travels in the garb of disease, he is provided with a passport that places him beyond reproach. And so, born out of and upon the primary instinct of self-preservation which demands that the organism must exist, we find developed as a biological necessity a means of protection for the weaker organism. He is unable or unwilling to face the problem that confronts him and, in the shelter of a neurosis, he is carried over the difficulty while, at the same time, he is saved from the destructive sensation of absolute defeat. It is a compromise, the best at hand, and arises out of the biological needs of the organism.

So much for the hysteric, but what about the individual who presents the typical picture of a fatigue neurosis—true neurasthenia? Here the picture is one of bodily inefficiency. The patient is often thin and pale, he becomes fatigued on the slightest exertion, the respiratory rate advances, the pulse is rapid, he shows some cyanosis and often the onset of dyspnoea renders activity of the mildest grade, impossible.

Can we apply the same principle of a defense reaction in these cases? The natural defense of the organism against fatigue is rest, and in the ordinary happenings of life there is sufficient rest to permit of the repair of the ill-effects of fatigue. The normal individual finds ample time for the neutralization of the effects of his mental and physical effort. Now let us suppose the intervention of another element, the wish to evade obstacles and to run the race with as little discomfort as possible and especially the desire to gain a satisfaction, otherwise impossible, and we have built up all the mechanism necessary for neurasthenia. It is a state of chronic fatigue. The individual realizing the subjective sensations that accompany the fatigue state, learns to anticipate these sensations and too readily prepares for their acceptance. This state of mind plays the part of a break upon effort until, finally, that stage is reached where effort and the fatigue sense becomes indistinguishable. He is the victim of a fatigue neurosis—neurasthenia.

Here, too, we can discern the defense mechanism brought into play in order to prevent the ultimate end of complete dissolution. In this type of neurosis we come nearer to the physiological level of activity, as opposed to the psychological. It constitutes the nearest approach to the organic, and in the later stages, when the defense reaction is well established, springing to the forefront on the slightest stimulus, it is doubtful if we are not dealing with a state of organic incapacity. This is the type, too, that develops as a result of pre-existing disease of definite organic cause and may be regarded as a biological necessity in the convalescence of such disease processes, as tuberculosis and other septic diseases.

It is probably somewhat premature to open a discussion on the rôle played by the endocrine system in the maintenance of the neurasthenic state. That they occupy a place of essential importance in our consideration of this subject, is beyond doubt, but until more is known of the internal secretions in general and the adrenal in particular, no very definite stand can be taken. Any consideration of the endocrine glands must embody a study of that, hitherto, uncharted domain of the sympathetic nervous system. The close relation between the sympathetic system and the activity of the internal secretory apparatus, especially the adrenal medulla, is evidenced in all recent study on this subject. Workers like Cannon, Elliott and Langdon Brown have proved, I think, beyond doubt, that the secretory output of the adrenal medulla is directly coupled up with activation of the splanchnic nerve, while Cannon has carried his observation farther and shown that activation of the splanchnic is directly controlled by the emotions, particularly the emotion of fear. This, then, gives us a working hypothesis which, beginning with the end organs—the secretory glands—carries us back through the ramifications of the sympathetic nervous system, finally to arrive at the source or generator of all such activity—the emotions.

I do not wish to take up your time with any detailed report of this work, for in any case, as Timmie states, much of it is, as yet, controversial and not a little without sufficient foundation. Yet, I simply wish to draw attention to the fact that the emotion of fear—the concomitant of the instinct of self-preservation, may, in the light of present knowledge, be regarded as the dynamo of that wonderful and fascinating system, the greater understanding of which, will, I believe, open the door to a sounder knowledge of all these abnormal conditions that constitute the neurasthenic state.

What, now, *of the treatment of these cases?* Can, after all, anything be done to make life easier for this class of patient? If so, from what side should we attack the problem? We believe that it is all a question of conflict between the personality and life's obstacles. Are we then to attack the problem on the side of the personality or attempt to level off the bunkers in life's course? Personally I think we have been doing too much levelling, endeavouring to make the course too easy and paying not enough attention to bolstering up the personality. The mediocre golfer who knows his own little 9-hole course can, if he stays there, make a fair showing and cover the course with a fair degree of satisfaction. He knows all the bunkers and from experience, I might say habit, contrives to utilize the ground to fair advantage. Now put him on a new championship course and he is lost. He learns for the first time, maybe, that he has never mastered the essential of the game,—the swing. He finds trouble everywhere, is continually in the bunkers and finally, becoming thoroughly discouraged, writes himself down a failure. Now put this player under a competent professional, re-educate him in the essential of golf and if he is not a confirmed dub, he will soon learn to smile at the trouble. He will have found himself. If he is not a confirmed dub?—yes, that is the question we must first settle in dealing with these cases. Is the patient capable of attaining and holding any level of efficiency? Is he mentally deficient? If so, and this deficiency is at all marked, we may as well save our energy. He is a derelict and must be carried through life on the backs of a willing and sympathetic public. Our field of endeavour must lie with the normal or slightly subnormal individual who has encountered the more severe obstacles and failed. Even here, let us first of all be sure of our diagnosis. One case of mistaken diagnosis often dampens the ardour of the physician to such a degree that he shies at any future attempt. He may then join the ranks of those who believe that all functional disease is the outward expression of some hidden organic process. It may really be that at the root of all the trouble in any one case, lies a dormant septic focus, and it is but rational to first eliminate the possibility of focal disease.

Let us not, however, carry this conviction too far; the present day campaign carried on against teeth, tonsils, rectal atonia, etc., has been provocative of a great deal of unnecessary, harmful and expensive operative indulgence. The old grudge that so many practitioners held against the uterus and cervix is fading but slowly. Just how a variation in the geometrical relation of the uterus to the pelvic cavity, can produce or influence the mental state, is difficult of explanation; and yet, the tendency to pick upon and ruthlessly assault the uterus or ovaries, is amazing.

You who are familiar with the writings of the ardent disciples of focal infection, must wonder why any neurotics remain and why we any longer, require institutions for the care of such cases. Let us be generous and put it down to over-zeal, which is not to be ridiculed; but always let us be honest and, sometimes, let us exhibit the elements of common-sense. At this point we may consider some of the so-called cures in hysteria. The apparent disability in these cases is one of somatic disturbance—a localized paralysis or anaesthesia, a contracture or bent-back, an aphonia or hysterical blindness—that is, the mental conflict has been converted or exteriorized into a bodily defect—the so-named conversion hysteria.

One has only to scrutinize war literature to learn of the multitudinous methods of cure, employed in these cases, and note that the cure is always directed toward clearing up the conversion defect. Each worker extols his own particular method, whether it be massage, graduated exercise, hypnotism or painful faradism and all are equally successful so far as they go. There is, however, a noticeable avoidance of the real seat of the disease; the clearing up of a somatic defect in these cases is no more an eradication of the real disorder than the extinguishing of a fire in the front porch, while the furnace has blown up in the cellar. There is nothing easier in the whole realm of therapy.

The universal application of splints, jackets and supports is one of the surest ways of firmly establishing the reality of his trouble, in the mind of the patient.

Then, again, fictitious operations and methods involving trickery, are to be deprecated. They can carry no real therapeutic value if we consider at all the future of the patient. These methods no doubt were of value in the army and fulfilled a very real purpose, where we were concerned with the immediate repair of the patient, in order that he might be of some further, though necessarily depreciated use to the forces. In civilian life we must think of the patient's future and so must go direct to the source of the trouble.

I believe that no lasting harm is ever done by being frank and honest with the psychoneurotic. Tell him, tactfully of course, where his trouble arises, disregard whenever possible the little pains and discomforts which to him are so vital, and pay as little attention to his outward manifestation as possible. Explain in simple and understandable terms the mechanism of the conflict and appeal always to whatever moral sense he may possess.

It is with this moral quality that one must work. It is unnecessary to repeat that one must have and hold the confidence of the patient. The rest is education and we cannot expect to bring about any lasting change, unless time is spent in this process. This is the method of education and persuasion and is to my mind the only rational and efficient method of therapy in these cases.

Time will not permit of detail and after all the avenues of approach vary in individual cases. Suffice it to say, that if one keeps in mind the mechanism of the process and believes only in the re-education and strengthening of the patient's morals, one is on much surer ground than if he has recourse to temporary and superficial methods of suggestion. Let

Let me quote the following excellant words from Dubois.—"It is in their own education that patients ought to seek their cure and that people in good health should find their safeguard against nervousness. To find inner happiness and health he must turn his attention away from himself and interest himself in others. Altruism must take the place of natural egoism."

"Those whose reflections lead them inevitably to free thought will find in themselves, in a stoicism stripped of all egoism, the strength to resist all that life brings to us".

"Those to whom the nature of their minds still permits a childlike faith will find strength in their religious convictions, in proportion as they are living and sincere".

"Unfortunate are they who are indifferent, who seek nothing but the satisfaction of their material desires.

"It is dangerous to go through life without either religion or philosophy. I am tempted, without casting any reflection on believers, to say, more simply, "without philosophy" for religion itself can be efficacious only so far as it succeeds in bestowing upon the individual who believes a philosophy of life".

"Let one display the legend 'Master of my self' and patients will follow it to victory".

Intracutaneous Reactions in Pertussis.—Thomas G. Hull and Ralph W. Nauss, Springfield, Ill., used nine different preparations of pertussis vaccine, and 341 injections were made intracutaneously. The work was done at an institution where an epidemic of whooping cough was developing. The ages of the children tested in most instances were from 8 to 12 years. The results of the investigations recorded do not indicate that preparations of pertussis bacilli can be used intracutaneously to diagnose whooping cough. Freshly prepared suspensions, suspensions 3 years old, suspensions killed by heat and suspensions killed by chemicals gave results that were conflicting. Nearly all children, whatever their ailments, gave positive reactions. Whooping cough patients at times gave negative reactions, however.—*Journal A. M. A.*, June 23, 1923.

THE USE OF THE WASSERMANN REACTION IN THE DIAGNOSIS OF SYPHILIS

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To many medical men the result of a Wassermann test is the final, absolute criterion as to the presence or absence of syphilis in the patient under observation. A brief consideration of the theory that has been evolved to explain the reaction is conclusive evidence that such an attitude of mind is fallacious and productive of great harm to the patient. Were the Wassermann test a true complement fixation reaction, *i.e.*, were the substances tested for antibodies produced by the presence of the specific antigen, the *treponema pallidum* in the body, such a view would be correct but not only is the antigen non-specific, (not an emulsion of the organisms) but the substance, whose presence gives a positive reaction, is not a true antibody but a lipoid globulin, known theoretically as reagin, and is the result of the breaking down of certain tissues in the body. The production of reagin is most commonly the result of infection by various spirochætes, of which the spirochæte of syphilis is the only one found in temperate zones, but its production may occur in late tuberculosis, malignancy and occasionally in pregnancy. However, in this country, if the above mentioned easily diagnosed conditions are excluded, a positive Wassermann reaction usually means that the patient is suffering from syphilis, but as the presence of reagin depends on the activity of the infection, a negative reaction is of much less value in excluding the presence of the disease.

Believing that the Wassermann test is one of the most valuable diagnostic signs of syphilis, if properly interpreted, it is thought well to enumerate some of the errors that may result from a too slavish acceptance of its results and to outline a basic scheme by which the reaction may be used as a scientific diagnostic procedure. This can best be done by considering it in relation to each stage of the development of syphilis.

The use of the Wassermann Reaction in the Diagnosis of Primary Syphilis.

Although the primary lesion of syphilis occurs at the point of inoculation, it is but the outward manifestation of a systemic infection, for, by the time it appears, the organisms have invaded every tissue in the body. Tissue destruction of such a degree as to produce sufficient reagin to be detected by the Wassermann test on the blood, has not yet occurred, so that throughout the primary stage the Wassermann reaction is negative. In fact on this point depends the diagnosis of the stage of the disease, for primary syphilis may be defined as that period elapsing between the first appearance of clinical signs, (the chancre) and the appearance of a positive reaction in the blood. As a consequence the Wassermann reaction is useless for the diagnosis of syphilis during this stage and this is the more unfortunate because the primary period is the time *par excellence* when treatment should be commenced, for proper treatment started at this stage will give an absolute cure. This becomes increasingly difficult as the blood becomes positive.

The diagnosis of primary syphilis depends on the demonstration with the dark-field apparatus of the causative organism in the secretions from the lesion and from the satellite glands, and no matter how unsuspicious a genital sore may appear, it is a safe rule to regard all such lesions as syphilitic until repeated examinations fail to show the presence of the *treponema pallidum.* A genital sore should receive no local treatment whatsoever for ointments, wet dressings, or cauterization destroy the spirochætes that swarm on the surface and render their demonstration impossible. Should the general practitioner be unable to find the organism or should a dark-field apparatus be unavailable it is advisable to refer the patient to one of the provincial laboratories or to a specialist for diagnosis, as the risk of allowing a case of syphilis to become generalized is too serious to warrant any lack of care.

The Use of Wassermann Reaction in the Diagnosis of Generalized (Secondary) Syphilis.

The stage of generalization is that perio beginning a few weeks after the appearance the primary lesion and lasting an indefinite time, usually several months. This stage is characterized clinically by the host of secondary lesions, such as skin eruptions, mucous membrane ulcerations, and signs of mild ocular, auditory, visceral, osseous and central nervous system involvement. The picture presented by a case of generalized syphilis denotes a very active proliferation and a widespread dissemination of the infecting organisms, with consequent tissue reaction and an abundant formation of reagin, so that it is to be expected that the blood Wassermann reaction will be nearly always positive. This is found to be so in from ninety per cent. to ninety-five per cent. of cases during this stage, and it is during this time that the reaction attains its greatest reliability as a means of diagnosis. Unfortunately, its value is only corroborative for it is usually associated with such marked clinical signs as make the diagnosis certain without recourse to laboratory tests. Those cases that do not present a positive Wassermann reaction are frequently of a malignant type, and the question of diagnosis may easily be determined from the symptoms.

The Use of the Wassermann Reaction in the Diagnosis of Latent Syphilis.

With the subsidence of the signs of generalization a period of clinical latency commences, which may last from a few months to many years, before the symptoms of late (tertiary) or neurosyphilis manifest themselves. During this lapse of time the disease is not inactive but is laying the foundation for those destructive lesions that characterize late syphilis of the various organs.

Owing to the inadequacy of clinical methods to detect pathological changes during this period of latency, the Wassermann reaction is here the most valuable diagnostic symptom. A patient presenting himself for examination for syphilis and who shows no signs of active disease falls into one of four classes.

Class 1.—If there is a definite history of syphilis and the blood Wassermann reaction is repeatedly positive he should be treated as a case of latent syphilis. (It must be insisted that in latent syphilis, where clinical symptoms as an aid to diagnosis are absent, one Wassermann reaction is valueless. Several specimens from this type of case should be taken at different times and submitted to several laboratories to eliminate any possibility of technical error. All of these cases call for an examination of the cerebro-spinal fluid before a positive diagnosis is made. If the fluid is negative they belong to the variety of case here considered; if positive they are to be considered cases of neurosyphilis).

Class 2.—If there is a definite history of untreated syphilis and the blood Wassermann reaction is repeatedly negative it is advisable to administer to the patient one injection of arsphenamine, and take a specimen of blood for a Wassermann daily for the next seven days. If these are all negative the chances are that no syphilis is present, but the patient should be examined at least every six months for several years. If these bloods are positive, treatment similar to Class 1 should be given.

Class 3.—If there is a suspicious history of untreated syphilis and the blood Wassermann reaction is persistently negative the same procedure as for Class 2 is adopted, except that there need be no observation period following the negative results of the provocative injection.

Class 4.—If there is no history of syphilis and the Wassermann reaction is persistently strongly positive from different laboratories, and the spinal fluid is negative the question of the age of the patient is the important consideration. If under fifty years he should be treated for syphilis. If over fifty years of age, providing he shows no clinical signs of a chronic disease process that might be attributed to syphilis, the patient should be kept under observation for the remainder of his life and only treated if clinical signs appear, for if the age of fifty years has been attained without syphilis manifesting itself clinically, it is improbable that the disease will shorten the patient's normal longevity materially and it is, therefore, unwise to subject him to intensive treatment.

It should be mentioned that in this and the succeeding class of cases, a weakly positive or doubtful Wassermann reaction should be considered as negative, unless persistently present.

The Use of the Wassermann Reaction is the Diagnosis of Late (Tertiary) Syphilis.

Following the period of latency, untreated or inadequately treated cases develop signs of late syphilis, severe destructive lesions of any or all of the tissues. The pathological condition is the same whether the nervous system or the other parts of the body are affected, but owing to the highly specialized character of the central nervous system, it is felt advisable to consider late syphilis as two separate entities, *i.e.*, late syphilis of the general body tissues and neurosyphilis.

The diagnosis of tertiary syphilis is important for the general practitioner as it supplies the etiological factor for many serious conditions, particularly diseases of the viscera and the identification of the causative factor and the institution of proper treatment may mean the difference between life and death to the patient. In late syphilis there is not the intense spirochætæmia of the generalized stage but the tissues are sensitized to the action of the organisms so that a fewer number provoke a more destructive reaction in the host. The amount of reagin formed is small and, as a consequence the Wassermann reaction is positive only in a minority of cases.

In late syphilis, a persistently positive reaction means syphilis whether typical clinical findings are present or not but a negative reaction is valueless in excluding the disease. If a case shows definite lesions of late syphilis and a negative blood Wassermann reaction and spinal fluid it should be treated for late syphilis. If a case presents a condition whose etiology is obscure and the blood Wassermann reaction and the spinal fluid are negative, it may be necessary to have recourse to the therapeutic test in order to make a diagnosis. The usual plan is to administer to the patient two injections of arsphenamine at a week's interval. After the first the condition, if syphilitic, may be aggravated, but within a week after the second injection a syphilitic lesion will show such marked symptomatic improvement that there will be no doubt as to the diagnosis. During the week following the first injection, blood specimens should be taken daily to see if a provocated Wassermann reaction occurs. If not, it does not affect the diagnosis made by clinical improvement by treatment. Certain nonsyphilitic skin lesions improve under the therapeutic test but such doubtful cases are rare and when seen should be referred to a dermatologist for diagnosis.

The Use of the Wassermann Reaction in the Diagnosis of Neurosyphilis.

As mentioned before, neurosyphilis is but late syphilis attacking the central nervous system and it should be remembered that the patient with neurosyphilis requires treatment for his general systemic infection as well as for his neuro-involvement. The diagnosis of neurosyphilis depends on finding a positive cerebrospinal fluid, for early cases may be asymptomatic or clinically atypical, and the blood Wassermann reaction may be negative. Too great emphasis cannot be placed on the importance of an examination of the cerebrospinal fluid in every case of syphilis and in every case showing signs of disease of the nervous system, for only by this method can the presence or absence of neurosyphilis be determined. The operation of lumbar puncture, if properly performed, is simple, almost painless and devoid of any ill after-effects, and the information obtained by it invaluable.

The Use of the Wassermann Reaction in the Diagnosis of Congenital Syphilis.

The diagnosis of congenital syphilis depends on much the same factors as it does in the acquired disease, except that the primary stage is absent. If the case presents definite clinical signs, it is unimportant whether the Wassermann reaction is positive or negative. If clinical signs are absent at the time of examination and the blood Wassermann reaction repeatedly strongly positive, the patient has syphilis. If clinical signs are doubtful and both the blood and cerebrospinal fluid are negative, the blood and spinal fluid of the parents and other children should be examined, and if found positive, and the history is such as to support the supposition that the infection with syphilis antedated the conception of the child, the case should be considered one of syphilis. In case the foregoing is not possible, recourse must be had to the therapeutic test with two intravenous injections of arsphenamine. Fortunately, if the child's blood is examined after the first month, for up till then a negative reaction may be obtained even in the presence of syphilis, the reaction in a congenitally syphilitic patient is usually positive.

The Use of the Wassermann Reaction in the Diagnosis of Syphilis in a Pregnant Woman.

In the absence of a positive history or clinical signs, the Wassermann reaction is a useful diagnostic measure during the early months of pregnancy, in order that antenatal treatment may be commenced early enough to ensure the birth of a living non-syphilitic child. In the later months of pregnancy the reaction loses its specificity for the formation of large amounts of lipoid globulin in the blood of a pregnant woman sometimes causes false positives or negatives. Consequently whatever the result reported on the blood of a woman during the later months of pregnancy, the finding should be substantiated by another test made a week or so after confinement.

To sum up, the Wassermann reaction if properly interpreted, is one of our most useful diagnostic measures to determine the presence of syphilis in a patient, but it should be remembered that it is only a symptom and may be absent even in the presence of syphilis. In interpreting reports, the following should be borne in mind:

(1) The Wassermann reaction is negative during the primary stage, and cannot be used as a diagnostic measure at this period. This is of great importance because syphilis is more amenable to cure with proper treatment during this stage than at any other period of its life cycle and to wait for a positive blood Wassermann reaction may place the patient among the incurably diseased.

(2) The Wassermann reaction is usually positive during the stage of generalization. In those cases that show a negative blood, the clinical symptoms are usually so definite that there is little difficulty in making a diagnosis.

(3) During the stage of latency a repeatedly positive Wassermann means syphilis, but a negative one, in the presence of a positive history does not exclude the disease.

(4) Late syphilis not uncommonly shows a negative Wassermann reaction, but the use of a provocative injection of arsphenamine, the clinical picture, or the results of a therapeutic test, usually suffice to clear up the diagnosis.

(5) The diagnosis of neurosyphilis depends on the finding of a positive reaction in the cerebrospinal fluid; examination of the blood alone cannot be relied on.

(6) Congenital syphilis usually shows a positive blood Wassermann after the first month, but in suspicious cases where the blood is negative, recourse must be had to the same procedures as for late syphilis *plus* the examination of the blood and spinal fluid of the father and mother.

(7) During the first half of pregnancy, a positive blood reaction usually means syphilis, but during the second half false negatives or false positives may occur necessitating post-partum re-examination.

PELLAGRA IN ONTARIO WITH REPORT OF TWO CASES

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PELLAGRA was first reported in this province in 1914, by Forster and McVicar[1] who described two cases occurring at the Ontario Hospital, Toronto. Their article included a comprehensive discussion of the etiology and was illuminated by coloured photographs of their patients. Both of these patients died in August, 1913, and they are the first deaths from pellagra in Ontario as shown by the Registrar-General's Report. At the same time, Vrooman[2] reported a case in Brockville, which recovered and remained well for four or five years when it was lost sight of. In 1916, McClennahan[3] and Rolph[4] each reported a case

That these are not the only cases that have occurred, however, is shown by a study of the Reports of the Registrar-General for Ontario. From 1913 to 1922, inclusive, thirty deaths from pellagra are recorded. The lowest number occurred in 1922, when no deaths were reported, and the highest in 1919, with five deaths.

I could find no information regarding two of these, but of the remaining twenty-eight, twenty-one were women and seven were men, and all but six were between the ages of forty and sixty years. No cases occurred among children, as contrasted with conditions in the Southern States where children are frequently affected. Sixteen of the patients were born in Canada.

Most authorities state the mortality rate for this disease is from twenty-five to fifty per cent. If these figures are applicable in Ontario, it would appear that during this time there must have been approximately sixty to one hundred and twenty cases of pellagra in the province. This seems an insignificant number, but it is probably an underestimation, as symptoms may often be of a mild character and pass unrecognized.

The following two cases were observed at the Ontario Hospital, London, the first occurring in a woman who had been psychotic for sixteen years and the second developing a psychosis as one of the symptoms of pellagra. The diagnosis depends on what Knowles has called the three d's,—dermatitis, diarrhoea and delirium, all of rather a specific character, as indicated in the case reports.

CASE 1

L. M. C., 45, female, single, Canadian. Admitted 6 June, 1922. Two previous admissions in 1905 and 1909, making considerable improvement and being discharged one to three years later, respectively.

Previous History.—Good progress at school, no severe illnesses; lived at home until admission here, taking considerable interest in church activities and helped with the sick in her community.

Family History.—Not important.

History of the Psychosis.—Mental conditions similar on all three admissions. Alert, talkative, pompous, irritable, complaining, with changeable delusions of a grandiose and persecutory nature, claiming to be related to royalty, was going to sue the County of Kent for $15,000,000 and was going to build a wonderful hospital with this money and cure all cases of mental disease. Thought the nurses poured ether in her bed, tasted drugs in the food and at times refrained from eating for fear of being poisoned. Always finicky about her food. These symptoms continued without obvious deterioration until her death on July 11th, 1921.

Physical Condition during her several admissions revealed nothing of interest. She was thin; palate high; ear lobules adherent; many teeth absent; heart sounds distant and irregular, but no disease demonstrable; arteries not palpable; lungs normal; abdominal contents normal.

Attack of Pellagra.—On June 24th, 1921, patient attended a garden party on the hospital grounds, the day being warm and sunny. The next day her hands and arms were quite red on the dorsal surface extending to a line about midway between wrists and elbows. The anterior surface of each wrist was similarly affected except in the midline. The condition was considered to be due to sunburn and boric compresses were applied. A few days later a dusky redness appeared about the inner canthus of the right eye, becoming more extensive each day. Similar patches appeared on the forehead in irregular formation. About the same time she began to have several large, loose bowel movements daily.

Patient developed a pronounced asthenia and her mental state was one of confusion, disorientation and mild delirium. Marked twitching and tremours were generally distributed. Erythema on hands and arms did not alter materially until about ten days after its first appearance, when it became dull red and a few days later began to desquamate. Diarrhoea did not respond to treatment. Wassermann was 3 *plus*.

Symptoms became progressively worse and patient died on July 11th, 1921. An autopsy was not obtained.

Preliminary symptoms, which did not direct attention to the diagnosis made later, began in October, 1920, when the patient was noted to be weak and suffering from diarrhoea. In December, 1920, patient lost considerable weight and complained of diarrhoea and vomiting, but her statements could not be corroborated. She was given large doses of castor oil daily for several days and improved, and our notes at that time state, "her illness was probably due to auto-intoxication from being habitually constipated." In March, 1921, diarrhoea and weakness again appeared, for which no cause was found and she was given a tonic and special diet and showed some improvement, but diarrhoea continued intermittently until the acute onset following the garden party.

There was no history of previous attacks, although spells of vomiting and diarrhoea were reported in 1913. In January, 1918, patient had an erythematous condition on the forehead which was diagnosed as erysipelas. Eyes were closed by the oedema; the temperature reached 104°F. Patient was ill about one month. There was no rash on the hands, or diarrhoea at that time, and the diagnosis as made was probably correct although in the light of subsequent developments the erythema was at first thought to have some significance.

CASE 2

G. T., 36, female, married, Scotch. · Admitted 12th March, 1923.

Previous History.—Had always lived in Scotland until five weeks prior to admission, chiefly in Edinburgh. But little education, married at 26, one child; husband a labourer, always in poor circumstances. No previous illness of note; but she was always nervous. A nervous illness in the spring of 1922, but little information available. Immigrated to Canada five weeks prior to admission, arriving in Chatham about two weeks later.

Family History.—Not important.

Attack of Pellagra.—For six or eight months nervous and weak. Would twitch while sleeping. Was not ill during the voyage but was quite exhausted on arriving at destination. One week later complained of "queer" sensations in legs; was nervous and sleepless for another week, when mental symptoms were first noted, patient stating that a miracle had happened as the result of something bursting in her head. Confusion developed, patient imagining she was on the boat again, that the boat was sinking; could see the fishes, mistook relatives for others in Scotland; difficult to keep in bed, screaming and struggling at times in spite of marked asthenia. Diarrhoea commenced two days after onset of mental symptoms, stools being large, loose, foul-smelling. Three days later the dorsal surface of hands and wrists were noticed to be quite red, but relatives attributed this redness to gripping her hands for purposes of restraint, but were alarmed that it persisted for about forty-eight hours. She was admitted to the Ontario Hospital, London, on the next day, the 12th of March, 1923.

On admission was extremely weak, slight impairment of resonance over the right lung, but no râles. Soft mitral systolic murmur: rate 110. Abdominal muscles held rigid, but no tender points. Ptosis of left upper eye-lid. Speech tremulous and general tremulous condition of lips, tongue and fingers. Deep reflexes all exaggerated; ankle clonus present. Babinski negative. Dorsal surface of fingers and hands and palmar surface of both wrists were rough, brown and dry but no erythema noted such as described by relatives. This abnormal skin condition ended abruptly and irregularly about the level of the distal ends of the radius and ulna, the line of demarcation being quite distinct on both surfaces. The tongue was also large, red and glossy. Blood pressure, systolic 115, diastolic, 75. Red cells, 5,040,000, white cells, 16,400, haemoglobin, 70%, temperature, 99°-101°F. Condition was one of mild delirium; she was disoriented, showed considerable clouding, but could understand simple questions and reply by a gesture of the head. Conversation was limited, tremulous and rambling. At times tried to get out of bed without apparent reason. Repeatedly soiled the bed without appreciating the fact that she had done so.

Symptoms gradually increased in severity. Diarrhoea could not be checked, six to ten movements being passed daily, particularly pungent and foul-smelling. Five days after admission, a red patch about one and one-half inches in diameter appeared on the right side of the forehead, just below the hair line, which persisted. Nervous irritability became more marked, temperature higher (105°F.), asthenia more severe with development of coma. Desquamation on the hands was noticed for forty-eight hours before her death on the 25th March, 1923. Autopsy failed to discover any gross or microscopic lesion in the brain or other systems.

Discussion

A study of our cases reveals no definite etiology. Case No. 1 had had a dietetic error for many years due to her delusions about poison in the food, but so far as can be learned, no one element in the food was constantly absent. It is noteworthy, however, that temporary improvement followed purging and placing her on a more satisfactory diet. She finally died, however, in spite of this. Goldberger's[6] investigations indicate that pellagra is due to a protein deficiency and his rather sensational claims as to prevention and cure of this disease by the proper feeding of proteins would appear to make his theory almost conclusive, but he does not give a satisfactory explanation of the high mortality rate which continues in spite of adequate diet, nor does he explain why the disease is so common in middle-aged persons, who presumably have always lived on the same diet and in whom symptoms might have been expected earlier, nor does he explain the tendency to epidemics. Enright[7] reports a number of cases arising among German prisoners of war in Egypt in spite of an adequate diet.

Case No. 1 showed a positive Wassermann reaction in the blood shortly before her death although the test was negative a few years previously. There was no history of syphilis. Has this any significance?

Case No. 2 had had no known dietetic insufficiency although had always lived in rather meagre circumstances. An interesting point in her case is the definite leukocytosis which Hillman[8] reports is quite common in cases of pellagra.

Jobbling and Arnold[9] and others have reported finding a mould, the *aspergillus glaucus repens* in the stools of many of their cases. The former investigators attribute the symptoms of pellagra to the activities of this organism acting in a high carbohydrate medium producing a photodynamic toxin and their experiments are interesting and tend to bear out their theory. They believe the improvement in many cases following the administration of sufficient protein is due to the inhibiting action of proteins on the growth and toxin production of the aspergillus rather than to a simple correction of diet. With this idea in mind specimens of stool from Case No. 2 were cultivated on the special media described by them according to their technique but the fungus was not demonstrated.

The older theory that corn products either good or diseased caused pellagra has been largely discredited for surely this disease would be much more common in more northern latitudes, for many people eat corn products to a considerable extent and yet pellagra is comparatively rare except in semi-tropical localitites. Nevertheless Lustig[10] reports that the Official Italian Commission on the cause of pellagra has concluded that in Italy corn is the essential cause, possibly effective by reason of low protein and vitamin content in the corn diet of the peasants.

The etiology is, therefore, still uncertain but the work of recent investigators discussed in this article brings the solution perceptibly nearer.

I am indebted to Dr. W. J. Robinson, Superintendent of the Ontario Hospital, London, for permission to publish these cases, and to Dr. F. W. Luney, who performed the autopsy as well as other laboratory work.

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SOME OF THE FACTORS UPON WHICH THE SUCCESSFUL USE OF LOCAL ANAESTHESIA DEPENDS*

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Introduction

LOCAL anaesthesia has come to stay. Its many undisputed advantages make its use advisable in an ever increasing variety of surgical conditions. The rapid diffusion of knowledge among surgeons regarding the method of applying it as well as an appreciation of the necessity for a surgical technique compatible with its use, is greatly broadening its scope and taking from the field of general anaesthesia many classes of cases. In the hands of those trained in its use, almost every field of surgery has been invaded with success, and while one would not have the temerity to predict that local would eventually supplant general anaesthesia in the majority of instances, is it not conceivable that when the average surgeon of to-morrow can exhibit the skill of the expert of to-day, who in his turn may be expected to improve considerably, the relative positions now held by the two methods may be reversed? One finds a considerable number of surgeons who perform more of their major surgical operations under local than under general anaesthesia. Is it not possible that the prediction of master surgeons who have performed the vast majority of their operations under general anaesthesia, may be wrong? Is it not possible that an eminent authority upon gastric surgery for instance, might not be qualified to speak authoritatively concerning the subject of local anaesthesia, about some phases of which he cannot possess intimate knowledge? The main defect in opinions of this kind is that they reflect only the experience of those who give them.

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The future of local anaesthesia is in the custody of the younger generation of surgeons. A new type of surgery is developing. In this process of evolution we find the young man well trained in the technical surgical details, greatly aided by improved diagnostic methods and thus better equipped at an age when his mind and body are still plastic to assimilate the knowledge which those who have preceded him have left. Thus I find that my assistants can, and often do acquire in a comparatively short time, the ability to carry out a given procedure under local anaesthesia, the ability to accomplish the same having required many years of effort on my part.

It is in an effort to detail some of the requirements for the successful use of the local anaesthesia method that the following suggestions are presented. It is to be noted that these suggestions coincide with the best interests of the patient, a factor which is of course of paramount importance.

The Patient and the Surgeon—Obviously anyone who is properly equipped to do major surgery can, with training, operate under the local anaesthesia method. However, in order to obtain the best results one must bring to the work something more than the ability to diagnose disease and operate. Bearing in mind that these operations are carried out upon the conscious patient, one must possess or develop by cultivation and schooling, a broad, deep sympathy for, and understanding of the patient's mental processes. One must be able almost to feel any pain or indignity which the patient is forced to undergo with more keenness than the patient himself does. Nothing could be farther from the truth than the impression that the local anaesthetist should be of such adamantine qualities of mind that he might witness the needless suffering of a patient without being himself indelibly impressed. These qualities—the acute appreciation of the patient's mental attitude—make it possible for the surgeon to attune himself to the proper sympathetic accord and make it practically imposible for him to aid in perpetuating the most potent factor extant in discrediting the use of local anaesthesia, the *production of needless pain.* The surgeon with the requisite mental attributes who will properly prepare himself for the use of local anaesthesia will find that success will depend to some extent upon the factors discussed below.

Equipment and Environment — We have found that the attitude of patients in the private hospital is much more favourable to the method which may be said to be looked upon as more or less of an innovation at the present time, than that of charity patients. Even in private practice the education of patients and hospital attachés is a slow and tiresome process. Conviction of the merits of, and enthusiastic support of the method will naturally be a long time in replacing the prejudice one meets among these individuals. Each failure is apt to be accentuated and successful cases disregarded.

The influence of that wing of the profession which is unable or unwilling to use the method, acts as one of the greatest barriers to its acceptance, and the "anti-local" propaganda of this class produces the same effect here as in corresponding conditions in other branches of medicine.

This factor must therefore be reckoned with and the surgeon must realize that the attitude of his office force, hospital force and the medical profession of his locality, has a direct bearing upon the handicap he is facing. He should therefore make a special effort to meet these influences. The most potent factor in overcoming prejudice is by so applying the method that the actual truth regarding its advantages may become known.

The Operating Room—The use of local anaesthesia being a method in itself demands certain departures from the orthodox method of handling cases and the operating room and its squad should be equipped to meet the change in requirement. Training of attendants and composition of utensils should be designed to reduce noise to a minimum. The operating table should be one which will tilt in four directions and should be equipped with feather pillows. Some form of artificial light which will illuminate all deep cavities is a *sine qua non*. The room should be properly ventilated and of a proper temperature. Syringes of excellent design and construction, or better, a Pneumatic Injector, should be available, and needles of appropriate lengths and sizes must be at hand. The operating room force must be so trained that they will work swiftly and noiselessly, and visitors must be cautioned as to loud talking, etc. We have used music constantly since 1914 and feel that we could scarcely get along without it. A phonograph or the radio offers a desirable means of diversion to some patients. Every effort should be made to establish an *esprit de corps* among one's assistants so that their work may be as perfect as possible.

Psycho-anaesthetist—One of the prime essentials to the successful use of local anaesthesia is the presence in the operating room of a psycho-anaesthetist. A graduate nurse of tact and judgment should be trained for this position. She should be skilled in the administration of general anaesthesia and in local anaesthesia diplomacy. Her duties include making the acquaintance of the patient as soon as possible after he enters the hospital, recording his blood pressure and acquainting him with the fact that she is to look after him for his doctor during the operation. It is her duty to see that the patient is carefully transported to the operating room and made as comfortable as possible while there. During the operation she records the pulse and blood pressure and attends to the patient's needs regarding air, water and general comfort, instructs him as to co-operation, meets his anxiety with reassurance and co-operates with the surgeon in deciding upon the necessity for giving general anaesthesia which she at once administers should the occasion require.

Local Anaesthesia Technique — As stated above, equipment is of prime importance. In the early days, the horse was but slowly replaced by the automobile. However, he finally had to go. One may be able to use local anaesthesia with crude equipment but to use it successfully and with satisfaction, the most modern mechanical devices must be used. Simplicity, speed, accuracy, all demand it. The writer's experience leads him to favour infiltration or infiltration block anaesthesia as a rule except in the case of the trigeminus, the brachial plexus, the cervical plexus, the intercostals or when venous, sacral or transsacral are used. This throws a large percentage of major surgical cases into the former class and for this infiltration the Pneumatic Injector is ideal. It furnishes one with a solution under a constant known pressure controlled by the small cut-off with the needle mounted upon a ball and socket joint. The "pistol-grip" effect allows one to introduce solutions into deep cavities, as in the abdomen for instance, without obstructing the view with the hand. Muscle tire is eliminated and the infiltration is reduced to mathematical accuracy. The psycho-anaesthetist has entire charge of the apparatus, the surgeon being concerned only with the cut-off and needles. The self-seating bayonet lock needle which the writer has recently devised, meets every need. It may be removed instantly or as quickly locked in place, and possesses the additional advantage that if broken, the hub may be returned to the factory and the needle repaired at small cost.

In introducing the solution, the painless method of producing all secondary wheals from *beneath* and of anaesthetizing the skin by the subdermal method should be used. The field should be gone over methodically from end to end and all layers injected before beginning the operation. One should, however, not hesitate to reinforce the anaesthesia at any point provided the patient complains or a muscular contraction occurs. Perfect anaesthesia abolishes all reflexes.

Surgical Technique—Important as is the manner of establishing local anaesthesia, it is perhaps of less importance than the type of surgical technique employed when this method is used. Surgical strategy—a technique meeting the demands of local anaesthesia and incidentally the demands of the best interests of our patients—will be the deciding factor between success and failure in a majority of instances. The comfort of the patient, the facility with which the preparation is carried out, the deftness of the induction of the anaesthetic, will greatly aid in the triumphant consummation of any operation of especially difficult nature. The manner of carrying out the preliminaries may be the deciding factor between a perfect local anaesthesia operation and the necessity for resorting to general anaesthesia. Other factors may be: a degree of bodily discomfort to the patient, the faulty manner of introducing the anaesthetic, the failure to make use of the force of gravity by proper tilting of the operating table or by some overt act in surgical technique, any of which is inimical to success.

A stealthy manner of operating should be developed. The anaesthetic solution should be "sneaked" into the tissues. Pressure while incising should be avoided by elevating the skin. Incomplete anaesthesia should be recognized through the agency of reflex muscular action of the incised tissues rather than by word of the patient. The abdominal viscera should not be exposed in the presence of a positive intraperitoneal pressure. Successful abdominal surgery demands that the condition found at autopsy upon the fresh cadaver present when the peritoneum is incised, a condition which the writer has designated "negative pressure." One may then, by introducing elastic lateral retraction (the writer has devised a variety of wire spring retractors for this purpose) and by elevating the abdominal wall, utilize the force of gravity through the agency of tilting the operating table, with the result that the movable viscera will not obstruct the view and the opportunity will be offered to make a visual examination of the pathology present.

Anterior Splanchnic Anaesthesia—One may now introduce the anaesthetic into the splanchnic regions if this is indicated. It is entirely a matter of obtaining the proper exposure. In the case of the appendix, its mesentery or if necessary, that of the cæcum, may be infiltrated. In the pelvis extensive work demands a preliminary sacral or transsacral block, pericervical infiltration from below or anterior splanchnic at the pelvic brim may be used. Simple pelvic procedures require only local infiltration of the round ligaments.

Proper tilting, the reverse Tendelenberg, and the Trendelenberg position, negative pressure, an appropriate incision, preferably the transverse or the "L," combined with anterior splanchnic anaesthesia and an appropriate surgical technique have met the requirements in the hands of the writer in approximately ninety-five per cent. of his operation cases.

In conclusion I can only reiterate that it is my belief that local anaesthesia will be the choice for those who are willing to master the technique of its use for conditions in which it can be used successfully; that its successful use will depend largely upon refinements in the technique of its induction but more especially upon the development of a surgical technique which corresponds entirely with the demands of the best interests of the surgical patient and that aside from anaesthesia technique and surgical technique, success will be greatly augmented by attention to details which relate to the patient's general comfort. The training of hospital attachés and assistants, the gratification offered by proper equipment, the employment of a tactful psycho-anaesthetist, the utilization of the diverting and solacing effect of music and the radio and an intimate and sympathetic understanding of the patient's mental attitude must all be given special heed by those who expect to be successful in the use of local anaesthesia.

Urticaria caused by light.—W. W. Duke, Kansas City, Mo., reports the case of a woman who became so sensitive to light that on two and one-half minutes' exposure of the skin to direct sunlight, typical itching hives, with erythma of the skin, invariably appeared over the area exposed. The reaction was almost identical to the reaction of allergic individuals on intracutaneous injection of substances to which they are sensitive. Constitutional symptoms were felt on two occasions when a large area of the skin was exposed to light. Local tolerance was developed by repeated exposure of small areas of the skin to light, but it did not last indefinitely. The reaction was produced only by light of a wave length transmittable by violet glass.—*Journal A. M. A.*, June 23, 1923.

DIVERTICULA OF THE ALIMENTARY CANAL AS DEMONSTRATED BY X-RAY EXAMINATION

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GOULD defines a diverticulum as a pouch or cul-de-sac, whether normal or abnormal, leading from a main cavity. Of normal diverticula we have only a few examples in the human body, such as Meckel's diverticulum and Vater's diverticulum or ampulla. In the present paper we shall consider only the acquired or abnormal diverticula. As Dr. Charles Mayo states "the acquired diverticula comprise practically all the diverticula which are of clinical importance." The œsophageal diverticula or pouches, the various diverticula of the stomach, duodenum and ileum, and the multiple diverticula of the colon, all belong to this group.

Pathologists classify diverticula into true and false, or complete and incomplete, these terms having reference to the structure of the walls of the diverticulum in comparison with the structure of the walls of the organ from which it arose. That is, a true diverticulum has in its walls the same tissues and arranged in the same manner as in the normal organ. Whereas in a false diverticulum the walls consist of but part of the structures found in the normal organ, the structure usually absent being the muscular coat or layer.

In our consideration of the diverticula of the alimentary canal, we will begin at the upper end and consider first of all the diverticula of the pharynx and oesophagus. Pharyngeal pouches, often called oesophageal, are in reality diverticula of the posterior and lateral wall of the pharynx, into the loose areolar tissues around the oesophagus. The hernia usually occurs between the fibres of the inferior constrictor muscle due to a deficiency of the musculature or to some anomaly in the closure of the lower bronchial cleft. These diverticula are usually single, and vary in size from a few millimetres to 8 centimetres or more in diameter. Examination for these pouches is best made with the patient in the upright position using a thick barium paste, although they may often be outlined by the ordinary barium meal. The fluoroscopic examination is most important in order to distinguish them from stricture.

By watching on the screen while the meal is being taken, the pouch can usually be seen to fill, and when full, the bismuth runs out over the top into the œsophagus and passes readily down into the stomach. In some cases the pouch can be seen to empty into the œsophagus, when the patient contracts the neck muscles. A diverticulum has a smooth rounded base with a fluid level at its upper opening. On the other hand, a stricture has an irregular base and the barium leaves it by the lower end. A carcinomatous stricture is usually conical in shape and irregular in outline, not having the bulbous appearance of a pouch. The distinctive feature then between a diverticulum and any form of stricture is the fact that the former must empty from its upper end and the latter from the lower end.

Plates should always be taken during and following the fluoroscopic examination. As a rule lateral plates in this region will give a much better picture than an oblique or an antero-posterior position, although plates should also be taken in these positions.

Diverticula are rarely found in any other portion of the œsophagus, although a few cases, about 15 in all, have been reported in the last 25 years, and these have practically all been in the lower end of the œsophagus at about the level of the diaphragm. Carmen of the Mayo Clinic reports having seen only one case of diverticulum in this situation. So that the condition must indeed be quite rare.

Dilatation of the lower end of the œsophagus due to spasm or stricture at the cardiac opening is not particularly uncommon, and must be differentiated from a diverticulum. This is usually not difficult, as a diverticulum should present the same characteristics as found in a pharyngeal pouch, *i.e.* a rounded smooth base and emptying by its upper end.

If we stick to our definition of a diverticulum, namely, that its walls must consist of the same structures as the organ from which it springs, then diverticula of the stomach are also very rare. The pouch or pocket formed outside the stomach wall by a perforating gastric ulcer is not a diverticulum. Even the designation "false or incomplete" diverticulum is not applicable, as the walls are not formed of the same structures as the stomach wall. Faulkner reports one case of a congenital diverticulum found at autopsy, and Charles Mayo records a case with a diverticulum on the wall of the antrum 5 cms. from the pylorus and 4 cms. in depth. Carmen reports a case of an ulcer near the pylorus and close to it a diverticulum. The diagnosis in this case was duodenal ulcer, but the above condition was found at autopsy.

As in the stomach so also in the duodenum, diverticula are quite rare. A goodly number of cases have been reported, but at operation or at autopsy the condition was often found to be either an accessory pocket from a perforating duodenal ulcer, or the gall-bladder filled with the meal through a connecting channel due to a gallstone perforating into the duodenum, or a duodenal ulcer perforating into the gall-bladder. In obstruction of the duodenum, from whatever cause, the bulb or cap may become dilated, and this dilatation may at times form a true diverticulum due to a weakness in one portion of the wall.

Baldwin in 1911, collected and reported 82 cases of diverticulum of the duodenum. In many instances the diverticulum seemed to involve or take the place of the diverticulum of Vater, but about half of the cases were independent of the bile or pancreatic ducts. In 21 cases the diverticulum had perforated into the head of the pancreas. Case in 1917, reported having observed 8 cases of diverticulum of the duodenum, all located in the transverse portion.

We now come to a consideration of diverticula of the large bowel, and it is here that the x-ray has been of the greatest assistance in diagnosing the different pathological conditions found in the colon. Although not as common as some other lesions of the large bowel, diverticula are by no means uncommon, and are being found much more frequently as our search is being directed along that line. It is only within the last 10 or 12 years that the medical profession has had an appreciation of the importance of this lesion, and to-day it occupies an important place in medical literature, and is recognized as a distinctive pathological condition by every operating surgeon. During the last 7 or 8 years there have been many contributions to the clinical and radiographic features of diverticula, but the best presentation is that by McGrath in his paper "Etiology and Pathogenesis of Colon Diverticula," in which he states that true or complete diverticula are practically never seen in the colon; they are always incomplete, *i.e.* there is a hernia of the mucosa through the musculature commonly where the muscle is penetrated by blood vessels, near the mesenteric border of the colon.

Diverticula may be found in any part of the large bowel, but the great majority are in the descending colon and sigmoid. Of 32 cases reported by McGrath, 27 were in this situation, 3 in the rectum, 1 in the transverse, and 1 in the hepatic colon. The number of diverticula present may vary from 1 to 300 or 400, but the average is 20 to 30, and they vary in size from 1 mm. to 3 inches or more, with an average about the size of a pea. They are usually round or oval and sessile, but occasionally pedunculated, with a minute opening into the bowel. The sacs usually contain fecal material, which sometimes becomes fecaliths. Diverticula of themselves do not necessarily cause any symptoms. Telling estimates that only about 60% of persons with diverticula present symptoms. It is only when pathological changes take place in the walls of the diverticula, due to infection penetrating the walls and setting up inflammation, that the patient has symptoms. The condition which really causes the symptoms is a chronic extramucosal inflammation or a peridiverticulitis, which develops around the diverticulum. This tends to deformity and obstruction of the colon with the resulting symptoms of pain and constipation, but with no passage of blood. Occasionally a diverticulum owing to the thinning out of the wall, or to some unusual strain, may perforate suddenly and set up an acute general peritonitis, or perforating more slowly cause a localized abscess.

Many different theories have been advanced as to the cause of diverticula, but the same general law applies here as in all hernias, *i.e.*

wherever there is increased pressure within a cavity, and a local weakness in the wall, there is likely to be a hernia. In the region where diverticula most commonly occur, namely the descending colon and sigmoid, there is present increased pressure from gas and feces, and weakness in the wall where the blood vessels enter the bowel.

Diverticula occur more commonly in men than in women, in the proportion of about two to one; usually in those with a tendency to obesity, and of about 45 years of age. The symptoms are fairly distinctive. Chronic constipation, sometimes alternating with diarrhoea, but with no discharge of blood, is a nearly constant symptom. Left-sided abdominal pain is usually present and quite severe. In 30% of cases a mass is to be felt in the left lower quadrant. The diagnosis ordinarily rests between carcinoma and multiple diverticula, although the possibility of a left sided appendix must not be overlooked.

In cancer, pain is not usual until obstruction takes place, whereas loss of flesh and blood in the stool are early findings, but we must not forget that it is quite possible to have a cancer engrafted upon a diverticulitis.

The examination for diverticula is made during the routine gastro-intestinal examination by means of the barium meal. Usually 24 hours after the meal has been taken the colon will be found well filled. If the descending colon and sigmoid are not filled at that time, re-examination must be made at intervals to visualize that portion of the bowel while filled. Careful palpation under the screen along with a series of plates, will nearly always demonstrate diverticulitis if present. The diagnostic feature is oval or rounded shadows projecting from, or lying outside the lumen of, the bowel, and usually accompanied by narrowing and filling defects of the colon, due to the peri-diverticulitis. As these pockets tend to retain the barium, they can often be better demonstrated several hours after the colon is entirely emptied of the meal, and will then show as round or oval shadows along the course of the colon. A barium enema is not usually as satisfactory for demonstrating these pockets as the meal, but the enema does demonstrate the narrowing and filling defects better than the meal. We should also bear in mind that owing to the small size of the diverticulum or to its containing feces, or to the narrowing of the outlet, the sac may not fill with the barium, and thus only the filling defects of the colon are visible, and these often resemble a picture of carcinoma.

George groups multiple diverticula into three classes,—the first composed of those cases showing simple diverticula only, with very few, if any, symptoms. The diverticula can usually be seen during the routine meal examination, as round discrete shadows outside of, but close to, the colon. Practically the only condition with which it can be confused is a spastic condition of the colon, where discrete masses may be isolated in the haustra. These shadows will be found to lie within the lumen of the colon, and are only temporary, whereas a diverticulum is extramural and is permanent.

The second class consists of those cases showing early inflammatory changes around the pockets, with nearly always well defined symptoms. The diverticula, usually 20 to 30 in number, will be found in the descending colon and sigmoid region with some involvement of the colon for a few inches and slight narrowing of the lumen with localized tenderness.

In the third group there are present advanced inflammatory changes with marked filling defects and narrowing of the lumen associated with fairly severe symptoms mainly of an obstructive nature. In this and the preceding group, the condition from which it must be differentiated is carcinoma. This is not always possible, as a carcinoma may develop upon a diverticulitis. The history along with the physical findings and the x-ray examination will usually be sufficient to differentiate these conditions.

George calls attention to two points which must be borne in mind in examining the x-ray plates. First, that the appearance of the colon tends to remain constant over long periods of time in a diverticulitis, whereas in cancer frequent examination will show a rapidly progressing lesion. And second, the tumour mass in diverticulitis is outside the wall of the colon and not definitely circumscribed, *i.e.* there is a gradual transition from the normal bowel to the diseased portion, whereas cancer is a growth in the wall of the colon extending into the lumen and is definitely circumscribed with an abrupt transition from normal to diseased tissue.

Case Reports

SYNCHRONOUS RUPTURE OF BILATERAL ECTOPICS*

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The patient from whom this specimen was removed, was admitted to the Salford Royal Hospital, Manchester, on September 14th, 1922. She had been married sixteen years; had had one child, aged 14, and had not been pregnant since. The last menstrual period commenced on June 29th, lasted five days; amenorrhoea from that date until the 7th September. She then began to lose small quantities of very dark-coloured blood. On the morning of the 13th of September she experienced a very sharp colicky pain in the right iliac fossa, these pains continued for thirty-six hours and were diagnosed by her doctor as being due to a mild attack of appendicitis. At the end of thirty-six hours a very acute pain in the left lower abdomen developed and she at once became very weak and pale; she vomited four times during the day and was sent into hospital seven hours after the onset of pain in left side.

On examination, the abdomen was uniformly distended and diffusely tender, especially over its lower part. The patient was blanched, had a weak thready pulse, and was very restless and thirsty. Under an anesthetic, a soft diffuse mass was palpable through the vaginal fornix, on right side of the pelvis. I diagnosed a right-sided ruptured tubal gestation.

I opened the abdomen through a mid-line sub-umbilical incision. There was a large quantity of dark blood clot in the neighbourhood of the right tube, which contained a gestation sac that had ruptured. I removed the right tube. I then examined the left tube, which contained a gestation sac that, though itself unruptured, had ruptured that portion of the tube which contained it. The foetus was floating in an unruptured amniotic sac. There was still a brisk haemorrhage from the tube and it was from this one that the free fluid blood in the peritoneal cavity had come. This tube was also removed. Recovery has been uneventful.

I have been able to find records of but one other case. Before the Gynaecological Section of the Royal Society of Medicine of London, in November, 1921, Mr. A. E. Mortimer Woolf showed a specimen of double ruptured interstitial ectopic gestation. In his specimen there was a left interstitial pregnancy with chorionic villi present. On microscopical examination it also showed a right interstitial haematosalpinx but there was no chorionic tissue present microscopically, so the case has not been proved to be a pregnancy. In the specimen which I show, chorionic tissue in abundance is present in both tubes.

I believe that synchronous rupture of bilateral ectopics must be the most uncommon of all possible combinations of extrauterine gestation.

AN UNUSUAL ARRANGEMENT OF THE EXTERNAL GENITALIA

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This case is reported because of its extreme rarity, I have been unable to find records of any case of a similar nature in man, or of a parallel condition in any of the members of the lower animal kingdom.

The condition might be described as one of transposition of the external genitalia. The patient, a man, was admitted to hospital as a case of carcinoma of the sigmoid colon and it was during routine examination that the following condition was discovered.

The penis arose in the perineum posterior to the scrotum which was attached unusually far forward, on the pubes. The penis was very short measuring one and one half inches, and was normal in every respect except that it was webbed, the web extending between the median perineal raphe and the under surface of the penis, and was attached as far back as the anal margin; it was quite lax, sufficiently so to permit erection. The position of the meatus was normal in relation to the penis.

The scrotum was large and well formed, and when the patient stood erect it completely concealed the penis, it was to all intents and purposes a normal scrotum except that it was placed unusually far forwards and anterior to the penis, The scrotum was not bifid, it was rugose, and the usual median raphe and septum were present. The penile web was also rugose and it is probable that developmentally it is the true scrotum, the functioning scrotum having been developed from the pubic mons Veneris.

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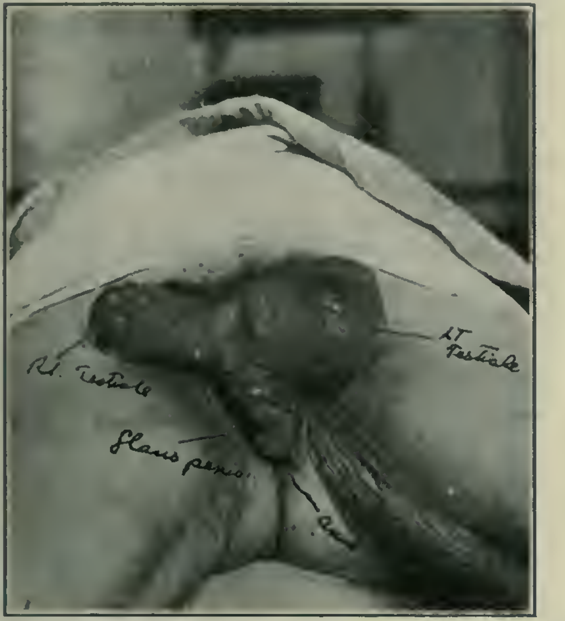
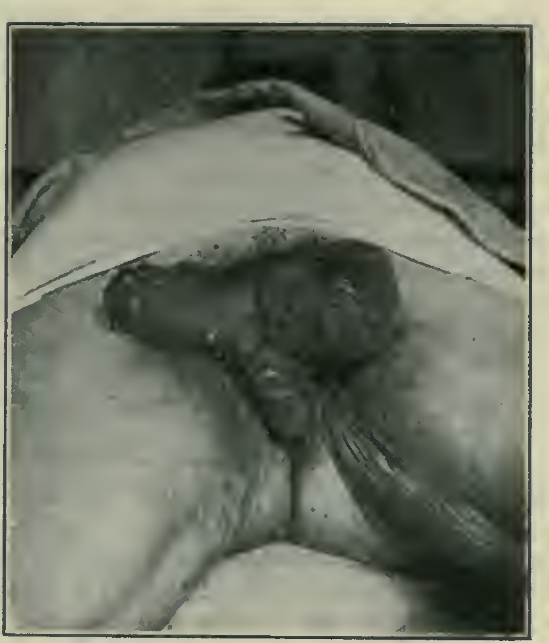
Complete transposition of the external genitalia I believe has never before been recorded. The gibbon has a pair of pubic testes and it would appear to be the only member of the lower animal kingdom, the arrangement of whose external genitalia approximates to the above description.

Although this patient died as a result of intestinal obstruction permission to perform a post mortem examination was refused, so the anatomy of the crura, etc., was not ascertained. The accompanying illustration was obtained by consent *post mortem*. He was married and had four children.





Treatment of Migraine with Peptone—Joseph L. Miller and B. O. Raulston, Chicago, report the results obtained in twenty-five cases of migraine from the injection of a 5 per cent. solution of Armour's peptone. The solution is prepared by dissolving the peptone-Armour in 0.9 per cent. sodium chlorid solution so as to make a solution of about 6 or 7 per cent. strength. This is neutralized, second normal sodium hydroxid solution and litmus paper being used as an indicator. The solution is then made to the volume required to make a 5 per cent solution, filtered until clear, and then placed in 5 c.c. ampules, and autoclaved in the usual manner. In order to determine whether the preparation is sterile, the ampules are incubated. and if they remain clear, they are ready to use. The first intravenous injection is 0.5 c.c., the dose being rapidly increased to 2 c.c. The interval between injections is unimportant. Miller and Raulston have usually given two injections a week until the headache disappears; then weekly, and, if the improvement continues, once in two weeks, and finally once a month. It has not been determined how frequently the injections must be given in order to prevent a recurrence. This period will probably show individual variation. - If the injections are discontinued, sooner or later the migraine will return. The longest period of freedom observed after discontinuance of the treatment was nine months. The total number of injections given varied from six to forty-two. Expressed in percentage, 36 per cent. were much improved, 48 per cent. were moderately improved, and 16 per cent. were not benefitted. These results correspond quite closely to those reported in the treatment of hay-fever by desensitization.—*Journal A. M. A.*, June 30, 1923.

Retrospect

GOITRE WITH HYPERTHYROIDISM

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Probably at no previous time has there been available for review and analysis such a number of exhaustive papers on the diagnosis and treatment of goitre with hyperthyroidism, nor has one previously encountered such a wide diversity of views as to the most efficacious method of treatment. Heretofore surgical removal and irradiation have vied for supremacy, but we now, in a forceful series of articles, are assured that an excellent prognosis may be offered to cases which submit to a regimen of "skilful neglect."

In October, 1919, co-operation between the various departments in the treatment of goitre with hyperthyroidism was secured at the Massachusetts General Hospital by the formation of a committee composed of two physicians, a radiologist, and three surgeons; and we now have before us a detailed statement of the results of treatment, both X-ray and surgical, of the cases which have passed before this committee.

Means and Holmes[1] have furnished an exhaustive analysis of the treatment of forty-four cases of exophthalmic (hyperplastic) goitre, treated by X-ray irradiation. Of these forty-four cases, twelve were cured, while sixteen were improved although not rendered entirely free from hyperthyroidism. Of sixteen cases which showed little or no improvement, eight were subsequently cured by operation. Two of the improved cases were also operated upon, with one cure and one death. None were made worse by irradiation. (The term "cure" is applied only to cases in which the basal metabolic rate is reduced permanently to within normal limits). Composite charts illustrate the trend in metabolism, pulse rate, and body weight. The striking effects of X-ray irradiation in particular cases are also vividly portrayed, and it is the opinion of the writers that the data presented are highly suggestive, if, indeed, they are not positive proof, of the beneficial effects of X-ray therapy in cases of exophthalmic goitre. On the other hand, the destructive action of the X-ray upon the thyroid gland is clearly evidenced by those cases in which a transient myxoedema developed. Where definite improvement is not noted at the end of five months, Means and his colleague consider further exposures undesirable, and they are of the opinion that surgery should then be employed. Emphasis is laid not only upon the limitations of the method, but upon the necessity of accurate dosage and wide spacing of the exposures (three weeks).

Richardson[2], in association with the same group at the Massachusetts General Hospital, reviews the results of operative treatment of thirty consecutive cases of exophthalmic goitre. By complete surgical treatment is meant the removal of the whole of the gland, except what in the surgeon's opinion is sufficient to maintain normal function. To secure this result more than one operation is necessary, except in mild cases.

Of the thirty cases of subtotal thyroidectomy, twenty-five (85%) showed a drop in metabolism to plus 15 or less. Four cases, with an average basal metabolic rate of plus 69%, although clinically greatly improved, still showed evidence of hyperthyroidism, presumably because an insufficient amount of the gland had been removed. One mild case, which developed hypertrophy of the remaining thyroid tissue, was subjected to a second operation.

A comparison of the composite charts furnished by Richardson and Means and Holmes, shows that the average results in all the cases treated by subtotal thyroidectomy are better than the average results in a selected two-thirds of the cases treated by Roentgen-ray; the metabolism showing a drop to plus 10, as compared with plus 20 in the Roentgen-ray cases, and the pulse a drop to 80, as compared with 90. The weight in the surgical cases showed a tendency to more persistent and greater increase. Richardson agrees with Means and Holmes that the improvement reported by the latter observers as the result of X-ray treatment is too constant and striking to be accidental or merely coincident with normal recessions, as suggested by Plummer. Richardson contends, however, that it is not possible to predict the effect of X-ray irradiation in any given case. He considers that the chief advantage of the Roentgen-ray treatment is that there is no immediate mortality, and in those cases in which the basal rate is brought to the normal level, the results of X-ray treatment may be considered satisfactory. The chief objections to the employment of the Roentgen-ray are, (1) the temporary character of the relief afforded in the majority of cases: being improved, but not cured, these cases are likely to refuse operation; (2) the danger of permanent myocardial change developing during the period of treatment, where reaction to X-ray is not prompt; (3) the danger of inducing myxoedema, four such cases having developed at the Massachusetts Hospital since the beginning of the X-ray treatment. Richardson concludes that removal of the gland is a more effective form of treatment of exophthalmic goitre than is the use of the Roentgen-ray.

In a series of three papers[3], Kessel and his colleagues include their observations upon fifty cases of exophthalmic goitre, from the wards of the Mount Sinai Hospital. All of the patients were carefully selected, with definite and persistent elevation of the basal metabolic rate. The metabolic status was the criterion by which were excluded many cases displaying the cardinal clinical symptoms of exophthalmic goitre—tachycardia, exophthalmos, goitre, and tremour, or the minor symptoms of diarrhoea, sweating, and palpitation, but without elevation of the basal metabolic rate: a group designated by Barger and Dale as "sympathomimetic," to which the authors apply the new term "autonomic imbalance."

Under etiology the authors discuss the predisposing factors, the syndrome of autonomic imbalance being detectable in ninety per cent. of the patients. Of the exciting causes, there was a history of mental shock in close relationship to the onset of the disease in seventy-two per cent. of the cases. There was a focal infection of the tonsils or sinuses in forty per cent.

The subjective and objective symptoms are discussed in detail. Reactions to atropin and epinephrin injections are tabulated.

In the subgrouping of the cases, the preexistence of autonomic imbalance pointed always to an unfavourable prognosis. In the group of older women, the eye signs were less frequent; goitre small; drug reactions rarely intense; fine tremour usually absent; but auricular fibrillation and diarrhoea much more frequent than in the younger group. In many of the older patients tachycardia alone was constant, and the basal metabolic rate was high and out of proportion to the other clinical signs. The prognosis in this group was also unfavourable.

The authors are unable to support Plummer's division of cases of hyperthyroidism into toxic hyperplastic (exophthalmic) and toxic non-hyperplastic (toxic adenoma).

Treatment.—The patients were placed at rest, under favourable hygienic and psychic conditions. High caloric diets (3,000 calories) were ordered, and to both nurse and patient was explained the importance of a gain in weight. Cool packs were given for restlessness, insomnia, and sweating. Phenobarbital gr. 1½ was prescribed as a hypnotic. Syrup of iodide of iron was given to reduce the size of the thyroid gland. Focal infections were dealt with surgically. The patients were informed that operation would not be necessary. In two patients with acute exacerbations, accompanied by fever, intravenous injection of thyroxin was followed by lysis and marked improvement. The period of rest in bed varied from six to ten weeks. The patients were then sent to the country for a month. During this latter period the gain in weight was always large.

Results.—There were three deaths, due directly to exophthalmic goitre. Two cases are reported as complete failures. One patient had a remission following over-work and acute tonsillitis; he had previously been well for one year. Three patients are still unfit to resume their occupations. Forty-one (82%) have been socially or economically restored. Twenty-seven of these (54%) were restored within four months. Two patients died from diseases other than exophthalmic goitre, one from gastric carcinoma and the other from pyelitis, pneumonia, and pericarditis.

It is admitted that complete symptomatic recovery does not occur. Of forty-five patients upon whom adequate basal metabolic observations have been made, thirty-two (71%) have a basal metabolism of plus 18. In five others the basal metabolism has fallen to plus 25. That is, in thirty-seven of the forty-five patients included in this particular group (82%), the basal metabolism has fallen below plus 25. Nine patients still have a basal metabolism exceeding 25%. In one case (the oldest member of the group) the basal metabolism has risen under observation.

Among the authors' general conclusions may be mentioned:

(1) That there is a close relationship between exophthalmic goitre and autonomic imbalance, the latter probably being a stage in the development of the former.

(2) That the symptoms of autonomic imbalance are very similar to those in Graves' syndrome, but may co-exist with myxoedema.

(3) That the hyperplastic gland always contains less iodine than the normal or colloid gland; that the iodine content is inversely proportional to the degree of hyperplasia, and that, until a technique is devised for accurately measuring the secretion of the thyroid gland, the relationship between function and morphology is mere speculation.

(4) That adenomatous tissue has less affinity for iodine than the normal tissue in the same gland; that iodine will be bound by the non-tumour tissue before being taken up by the adenoma; that there is no evidence to show that alterations in the functions of an adenoma can occur without alterations in the non-tumour tissue in the same gland.

(5) That variations in the clinical picture are not due to alterations in the histological structure of the thyroid; that adenoma may be seen in any type of disease; that the inference that adenomata may be associated with increased or toxic secretion is unwarranted.

General Comment

The papers by Means and Holmes and by Richardson are illuminated by their candour, and accurately reflect the clinical experiences of physician and surgeon working in co-operation—which means the elimination of the prejudices which generally attach to men of specialized training,—in the desire to be helpful each to the other in the clinical investigation and treatment of a disease, the fundamentals of which medical science has yet failed to establish.

In these, as in the final papers reviewed, a definite and persistent elevation in the basal metabolic rate is considered the *sine qua non* in diagnosis, as it is also considered the only finite index of the results of treatment.

The term "cure" in connection with the Boston cases is applied only to those in which the basal metabolism is reduced permanently to within normal limits. It is recognized, too, by these writers that, while the limits of the surgical field are within sight, the possibilities of Roentgen-ray therapy still extend beyond the horizon. Here should be restated the emphasis laid upon the importance of accurate dosage and the avoidance of cumulative effects, where X-ray irradiation is employed.

The results as shown in these two papers may conservatively be expressed as 3 to 2 in favour of surgery. Surgery, however, is weighted with a mortality risk,—in well organized clinics between one and three per cent. on the case basis.

It should be emphasized that, where two methods of treatment are available in the same clinic, a certain percentage of patients will fall between the two stools. One can readily understand that an individual, who has entered upon a course of X-ray treatments with high hopes, which, however, were not realized, will feel dubious about the prospects of later surgical interference. And there is a second class, of improved but still toxic individuals, who will be so free from subjective sensations that they too will refuse surgical aid until serious myocardial changes compel them to seek surgical relief. Although the great majority of these late cases are definitely improved by thyroidectomy, they can not possibly be restored to a normal state of health.

One of the "residual symptoms" placed to the discredit of surgery is persistent exophthalmos, whereas the persistence of this sign may bear no more relation to the completeness of the cure than does the abdominal scar to appendectomy.

Considering not only the immediate but the remote results, surgery, in spite of a proximal mortality handicap, still offers the best chances of a permanent recovery from one of the most baneful diseases of all time. The percentage of cures, as pointed out years ago by Kocher, depends largely upon the duration of the disease and the degree of toxicity. Practically all early cases respond promptly and permanently to thyroidectomy.

The Boston combination suggests Kipling's words:

> "The Liner she's a lady......
> The Man-o'-War's her 'usband."

Where X-ray irradiation fails or is only partially effective, the surgeon is still available.

When we come to view the contributions of Kessel and his associates, we are hampered by low visibility. These papers, in so far as they deal with the diagnosis, pathology, and treatment of exophthalmic goitre, are impressive, but not convincing. Many of the teachings of eminent pathologists and clinicians are swept aside as being unsound. Time will permit of the consideration of only one fundamental point, which will appeal to all pathologists and clinicians, namely, the differentiation of toxic cases into hyperplastic and adenomatous,—a clinical differentiation which can be confirmed microscopically in all but a very small fraction of cases, this small fraction including cases in which foetal adenoma may be associated with areas of hyperplasia and with the clinical sign of exophthalmos, or even more rarely those cases in which the feature of hyperplasia is present in the adenomatous tissue, with the association of suggestive eye signs. The statement that the view that adenoma may give rise to toxic manifestations, is unwarranted, will not be accepted. Such a statement is contrary to all experience.

Finally, one must utter a word of protest against such irruptions in terminology as "sympathomimetic," which can be handled only with special tackle; "autonomic imbalance," which as a philological ineptitude darkens the mind; and "psychic insult," which is pedantic, hyperbolical, and lacking in humour. Such terms are impossible for use in the spoken word, and in print do violence to one's vision.

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Some Less Frequently Considered Portals of Infection in Arthritis and Iritis.—Three less frequently considered portals of entry of recurrent infections are discussed by Ernest E. Irons, Chicago: (1) the mucous membranes of the upper respiratory tract; (2) the tissues about the hila of the lungs, and (3) the intestinal tract. In some of these, the lesions are chronic and localized; in others, the infection enters directly through mucous membranes without evident previous lesion. In infectious arthritis, there are sometimes accompanying gastro-intestinal disturbances; in many, these disturbances appear to be secondary effects of the infection, or to result from interference with normal exercise and food-taking; but in some, the relation of symptoms is such as to suggest the possibility that the intestinal infection came first, and that the arthritis resulted from bacteria which entered the body through the intestinal mucosa. There are numerous case reports of iritis associated with gastro-intestinal upsets, constipation or diarrhoea in which healing of the iritis has apparently been hastened by treatment directed toward the intestinal tract, either by laxatives or by modifications in diet, with the elimination or reduction of proteins, fats or carbohydrates. It is entirely possible that the real source of infection in some of these cases was in the intestinal tract as assumed, but in many cases, no evidence is furnished to show that other of the recognized possible sources of infection were investigated and excluded. Further, it is possible that recovery may have been hastened by some of the measures referred to, indirectly through the improvement of general nutrition and increase of bodily resistance to infection; and hence, the fact of recovery following dietary or other treatment is not conclusive evidence of the direct etiologic relation of the intestinal infection to the iritis. It is thus difficult to prove directly, in the individual case of iritis or arthritis, that the infection that caused the metastatic lesions entered through the intestinal tract: but by demonstrating the absence of other sites of infection, the probability of an intestinal portal of entry may be arrived at, provided the conditions under which invasion of the body from the intestine occurs are known. Four cases of ulcerative colitis were studied, and in two of the four the author isolated organisms in cultures from the blood during febrile periods. In both successful cases the organism isolated was a gram-positive staphylococcus which produced a marked zone of hemolysis on blood agar plates, and was identical with a staphylococcus which occurred in overwhelming numbers in cultures of the stools of the same patients. When conditions are favorable to the entry of organisms through the bowel wall, and when at the same time resistance to infection is depressed, it seems quite possible that metastatic lesions from an intestinal portal may occur.—*Journal A. M. A.*, June 30, 1923.

Editorial

THE ROCKEFELLER FOUNDATION—ITS ACTIVITIES AND ACHIEVEMENTS

THE recent publication by the Rockefeller Foundation of a statement of its expenditures during the last ten years has once more drawn attention to the character of the service which this organization is giving throughout the world in the fight against disease and in assisting medical education and science to be a potent factor in determining the successful issue of this struggle.

This organization was chartered by a special Act of the Legislature of the State of New York passed in May 1913, and it has now completed the first decade of its history. Its endowment was the gift of John D. Rockefeller, Sr. Of this about $174·000,000 remains, but the Foundation has already expended $17,500,000 of the principal and all of the income, amounting to about $59,250,000; while it has already pledged a further amount of $15,500,000 to a number of medical schools and health projects throughout the world. How carefully and economically this great endowment has been administered may be gathered from one fact which will impress the business mind: of the $76,757,000 expended in the last ten years, only $1,107,174, that is 1.44 per cent., were spent in the administrative work of the Foundation, or $110,717 a year.

Of the $76,757,000, public health engaged $18,188,838; medical education $24,716,859; war relief $22,298,541; and all other philanthropic work $10,445,628, charities which included $1,000,000 given to Mr. Hoover's child-feeding campaign in Europe.

The Foundation established in 1913 the International Health Board to promote public health throughout the world, by demonstrating the methods and costs of controlling certain diseases, notably hookworm disease, malaria, and yellow fever; by fostering the growth of governmental health agencies; and by encouraging the formation of splendidly staffed, highly equipped schools of hygiene.

Of the magnitude of the war against the hookworm disease an indication is furnished in an estimate made in 1915 that at least 20,000,000 inhabitants of the globe were carriers of this parasite, chiefly in the tropics and sub tropics, but it was prevalent in the mining areas in the temperate zone, particularly in Europe, affecting over 70 per cent. of the population. Its very prevalence over so great an extent of the globe, leading as it does to deterioration of physique and a greater incidence than would otherwise obtain of malaria, pneumonia, and tuberculosis, branded it as a menace to civilization and human welfare in more than one half of the inhabited portions of the globe.

The struggle against it is almost titanic in its magnitude, and is to be carried on so long as there is a focal point anywhere for the spread of the parasite. Its incidence everywhere, in the tropics more particularly, must be prevented or controlled not by the individual effort so much as by constituted authority, state and other organizations, and the International Health Board set itself to the task of demonstrating in centres throughout the affected regions the control of the disease. What success can attend such demonstrations was shown in a county in Virginia in which a survey in 1910 showed that 82.6 per cent. of the school children were infected. An anti-hookworm campaign was instituted with the result that fifteen months later a survey showed that the infection was reduced to 35.2 per cent. and ultimately, in 1921, to 2.2 per cent. As an outcome, "the glow of health had come to once pallid faces, chronic invalids had returned to active work, farms gave larger returns, the school enrolment had increased, pupils were alert, new energy and spirit manifested themselves" in all the life of the county. Such demonstrations were made by the International Health Board to the governments of eighteen different countries in South, and Central America, the West Indies, India, Ceylon, Borneo, Siam, and Australia. In almost every case the authorities organized for a permanent control of the disease, and in consequence, it is certain that the governments of all the regions of the globe affected will in a few years take such measures as will reduce the prevalence of the disease to an almost negligible minimum.

A similar campaign is being waged against yellow fever by the International Health Board and the result is as promising. "Yellow fever is on the retreat" and the discovery by Noguchi, of the Rockefeller Institute, of the germ causing the fever and of a vaccine and serum for it, will in a few years terminate what has been a scourge of tropical and subtropical America. In its crusade against malaria, begun in 1916, the Board undertook to prove that the disease can be practically eradicated at a *per capita* cost which makes elimination cheaper than tolerating the disease and the demonstrations which were made in nine Southern States to indicate how it could be controlled resulted in showing that substantial reductions in the prevalence of the disease were effected at an average *per capita* cost of $1.01, and in some localities, of $0.25.

The Foundation has endeavoured to foster the training of physicians and others who enter a career in preventative medicine. It was found that in the 48 States of the Union less than 11 per cent. of those engaged in directing or controlling public health, at least 10,000 in number, had undergone special training for this work. On the estimate made that 20 per cent. of the maladies which produce the total death rate can be controlled by the sanitarian, and because prevention calls for a special training which the ordinary course for the medical degree does not exact, it is clear that an effort on a large scale must be made to give the special training to the new recruits to the ranks of the sanitarians, and to this end the Foundation promoted the establishment of special Schools of Hygiene. Some of these it has endowed or assisted in a munificent way. The Johns Hopkins School of Public Health was financed for five years and it has recently been given an endowment of $6,000,000. The Harvard School of Public Health has been generously supported. These two schools will be the forerunners of others in the United States and elsewhere which will train sanitarians of a highly qualified character as the guardians of the public health in the years to be. To other lines of Public Health work, such as for example, tuberculosis in France, mental hygiene, social hygiene, infantile paralysis, fellowships and public health education, the Foundation has devoted $3,163,000.

In the assistance it has given to medical education throughout the world the Foundation has established a special record for munificence. It has already given $24,716,889 and in addition it has pledged $15,500,000, the much greater part of which is to be devoted to aiding medical schools. It has allocated $5,000,000 to Canada, it has aided the Medical Faculty of University College Hospital and Medical School, London, to the extent of £1,205,000 and it has given $3,500,000 towards the cost of reconstructing the medical laboratories and the hospital associated with the University of Brussels. The Foundation has aided the medical school of the University of Chicago, promised

$1,000,000 to the medical school of Columbia University to enable it and the Presbyterian Hospital, with which it is closely associated, to build on an uptown site a combined medical school and hospital group of buildings.

Perhaps the most novel and at the same time the most far-seeing undertaking of the Foundation is that involved in its effort to introduce western medical science into China, a country of 400,000,000 people, subject to an annual death rate of nearly 5 per cent., the home of disease in all its forms and varieties, and where the traditional lore of medicine is but a mixture of quackery, myth and superstition fostered by an uninterrupted history of nearly four thousand years. The Chinese mind is slow to change. After a century and a half of missionary effort there are not more than three and a half million of Chinese who are adherents of the Christian religion. At this rate of conversion it woud take twenty centuries to convert China as a whole to the religous views and the mentality of the western world. This change, however, may be precipitated by the acceptance of western medical science during the next thirty or forty years, and the most influential force in promoting this acceptance is and will be the work of the Union Medical College and Hospital at Peking, which since 1916 has been controlled and financed by the China Medical Board of the Rockefeller Foundation. This College, chartered under the laws of the State of New York and meeting the requirements of the Board of Regents of that State and the Standards of the Association of American Medical Colleges, is staffed by highly qualified teachers of western origin, the great majority of whom have been trained in America and Great Britain and in this respect as well as in its equipment it will not suffer by comparison with the best American medical school. The college buildings and the hospital associated with it, all of a splendid type, cost more than $6,000,000, and could not be reproduced in America for less than twice that sum. The annual upkeep amounts to about $700,000. All this expenditure has been met by the Foundation through its China Medical Board.

Already this School of Medicine is a factor in modernizing the Chinese outlook. To it come each year an increasing number of the best students who will in the next twenty years be leaders and exponents there of western scientific medicine which is bound to be of incalculable benefit to the swarming millions who have hitherto been subject to an incidence of disease without a parallel elsewhere on the globe.

So much for a brief survey of the achievements of the Foundation for the last ten years. It serves to indicate how this great organization is attempting to perform its part in promoting "the well-being of mankind throughout the world," the object of the Foundation, as its charter puts it. It has begun splendidly and it will, under the wise guidance of those now in control of it, prove of incalculable benefit to mankind and thereby transmit to posterity an abiding memory of one whose insight determined the character of so unexampled a munificence as made the Foundation possible.

A. B. M.

THE ANNUAL MEETING

THE annual meeting recently held in Montreal was a notable success from every point of view.

The setting was ideal inasmuch as the spacious quarters on the top floor of the Mount Royal Hotel permitted of the consolidation in one area of all the manifold interests of the Association.

The arrangements for rapid registration of members were well conceived and at the booth erected for the purpose were placed the various wickets dealing with railway certificates, incoming mail, local address of visiting members, ticket for entertainment, programme, daily bulletins, etc. Around the walls of the same hall were arranged the commercial exhibits, a fine and varied display. On account of this excellent position the business firms were loud in their approval of this arrangement.

Seven hundred and twenty-seven members were registered, and over one hundred and sixty new members were enrolled.

The programme was printed in a handy pocket size booklet of fifty pages, giving in detail all that had been prepared in the way of scientific and business programmes as well as entertainments; and including those of the societies meeting in conjunction with the C.M.A., *i.e.*, The Canadian Society of Anaesthetists; the Canadian Radiological Society, The Canadian Society for the Study of Diseases of Children and the Canadian Medical Protective Association.

The scientific sessions were well attended in spite of fine weather and the lure of the out-of-doors. The hospital clinics in the forenoons were especially appreciated and much interesting material was presented and discussed.

Of outstanding merit was the orthopaedic clinic by Sir Robert Jones who occupied over an hour, all too short, and with abundant material of some thirty patients demonstrated and discussed the various conditions illustrated.

Sir William Taylor, of Dublin, delivered an interesting paper on intestinal obstruction, dealing in large measure with the subject of intersusception.

Dr. W. J. Mayo's paper, "Septic Factors in the Great Plagues," covered under an original title a discussion of the problem of cancer and tuberculosis.

An interesting and instructive address was delivered by Dr. S. A. Kinnear Wilson, of London, England, on "Queens' Square Hospital and the men who made it." This address, which was profusely illustrated, was presented at the evening reception and delighted a large audience.

The Eye, Ear, Nose and Throat section met separately, having arranged clinics at the hospitals, and sessions at the hotel.

Dr. J. S. Fraser, of Edinburgh, read a paper on, "Cerebellar Abscess," and Dr. Luther C. Peter, of Philadelphia, discussed the diagnostic value of modern Perimetry.

The important business of the Association was dealt with by the Executive and its Council and was presented in more or less finished form to the members at the official luncheons which were held daily.

In a future number of the *Journal* will be announced the business which was dealt with, and the plans for the coming year.

Some mention must be made of the entertainment provided. The official luncheons were a great success. They served to bring friends together for a good time; were a means of obtaining a large attendance for the transaction of business; and ensured against delay in the commencement of the afternoon session.

Guests of honour at these luncheons included Sir Robert Jones, Dr. R. Boulet, President of the College of Physicians and Surgeons of the Province of Quebec, and the Hon. Dr. J. D. Maclean, Secretary of the Province of British Columbia.

The reception on Tuesday evening was presided over by Dr. S. E. Grondin, President of the Province of Quebec Medical Association. The address of welcome was delivered by Sir Arthur Currie. Other addresses were given by Drs. Kinnear Wilson and M. J. MacEachran. After the formal addresses had been delivered, the floor was cleared and dancing kept up until a late hour.

The official banquet was the *piece de résistance.* Nearly four hundred covers were laid and a most enjoyable evening was spent. No speeches were indulged in, but characteristic entertainment was provided by "Jimmy" Rice and his associates.

Through the kindness of Mr. and Mrs. J. W. McConnell, the members and ladies accompanying them were accorded a garden party at their beautiful lakeside home, "Ashburton Downe."

The visiting ladies had special functions arranged for their leisure hours. On the first day, parties were taken on motor drives, in and about the city; on the second day a banquet was held synchronously with the banquet for members. Some one hundred and forty ladies were present. On the third day the ladies were given their choice of a luncheon at the Royal Montreal Golf Club or a sail through the harbour, and down the river. This last was through the courtesy of the Harbour Commissioners of Montreal, whose tug *Sir Hugh Allan*, was placed at the disposal of its guests for whom a buffet luncheon was served on board.

Great enthusiasm greeted the reading of the financial report which showed a very substantial surplus. The report will shortly be published in these columns.

Not only was the meeting itself a success, but from all sides were heard expressions of satisfaction at the very real impetus given to the activities of the Association in recent years.

MEDICINE AT THE ANNUAL MEETING

THE innovation, if so it might be termed, in this year's programme of the Canadian Medical Association which turned the mornings over to local clinics for the demonstration of cases, and set apart the afternoons for arranged papers and discussions worked out to the greatest good to the greatest number.

So far as the programme in the department of medicine is concerned there is no doubt that spontaneous discussion is most desirable, but as a matter of fact, spontaneity has often been a synonym for unpreparedness, and both good luck and good management might be required to prevent such discussion from becoming desultory.

A set programme, the items of which were bounded by the hands of the clock perhaps limited individual initiative, but furnished excellent "terminal facilities."

The medical subjects treated in the general sessions were essentially those which would interest the average man. myocarditis and nephritis, pleural infections, and diabetes, like the poor, we have always with us, and also like the poor, they are not easily disposed of, and those who were appointed to discuss them, Dr. Kenneth MacKenzie, Dr. Duncan Graham and Dr. F. J. Banting did not make the mistake of talking over the heads of their audience, and in each instance covered the ground without littering it with detail.

Dr. Wm. Boyd, in discussing epidemic encephalitis, even added to his previous contributions to the subject, and one cannot refrain from commenting upon his suggestion that the virus of encephalitis may continue its activity long after the first shock of its invasion is over.

The medical guest of the meeting, Dr. S. A. Kinnear Wilson, of London, charmed his audience in his public address upon the history of Queen Square and the men who made it, but perhaps even more did he charm the smaller groups in the hospital clinics.

His cultured erudition, moving about with the same ease through the mesencephalon as among the subtleties of English speech was alike the delight and the despair of those who listened to him. *Palmam qui meruit ferat.*

The "Medical Week" of the meeting, in which both before and after as well as during the official sessions, the clinicians of the city were "at home" in their wards and laboratories to groups of visitors was an altogether satisfactory feature, while the cases picked out for demonstration in the set clinical periods were well chosen for the purpose, and of more than ordinary interest, and the attendance and attention at these group meetings would warrant a repetition of this type of programme at future sessions of the Association.

Canadian medicine if it were judged from this meeting might with honesty be said to be sound, safe, and sane, with no meteors visible in the June sky.

OUR INTER-PROVINCIAL RELATIONS

THE Committee appointed by the association last year on Interprovincial Relations, presented through its chairman, Dr. M. T. McEachern, what must be regarded as an interim report. The purpose for which the committee was appointed has already been referred to in a previous editorial, and upon the able functioning of such a committee the more perfect organization of our profession into a national organization will greatly depend. Canada is a country of great length with little breadth, and its West is separated from its East by nearly a thousand miles of wilderness. Its highways have to pass through forest and mountainous districts, and travelling in many places is difficult. Its population is still widely scattered, and physicians desirous of attending annual gatherings have difficulty in finding confreres or substitutes to attend to their practice while absent. There is great danger, therefore, of a large number of our profession remaining strangers to the other portion and in time becoming indifferent to it. There is, therefore, a necessity if we are ever to become a strong national association to develop and strengthen all possible bonds and ties between the various portions of our country. At the present the most important are the monthly journal and the annual meeting. The committee believe that at the present it is of great importance the *Journal* should be strengthened in every possible way and that it be made a means of intercommunication between all the provinces, and that a great effort should be made to increase its subscription list in order that it may serve this purpose and reach every member of the profession. The committee also suggests the desirability of having permanent head-quarters, with a good office, proper equipment and an active personnel. To secure this a more complete organization is a necessity. Our association requires an energetic Field Secretary, and a Council composed of enthusiastic members, in touch with the various provincial organizations and through them with all the county or local units, thus securing definite avenues for interaction and interchange of thought. With such an organization our association should become a service bureau for the entire profession on all matters affecting its interests.

Hemorrhagic Osteomyelitis.—Max Strunsky, New York, reports a case of hemorrhagic osteomyelitis of the tibia following a fall. At operation, a cavity in the bone was found, filled with a viscid, bloody material. The cyst was curetted and scrubbed with iodin and alcohol. The incision was then enlarged over the entire length of the tibia, and the entire crest of the tibia removed. The graft was cut into fragments and dropped into the cavity, which even then was only one-third filled. The patient recovered entirely in eighteen months.—*Journal A. M. A.*, June 23, 1923.

Editorial Comment

CANADIAN SOCIETY FOR THE STUDY OF THE DISEASES OF CHILDREN

The first meeting of this society took place in the Mount Royal Hotel on June 15th and 16th, and must be regarded as a very successful beginning to a society which we trust may in future play its part in advancing our knowledge of the many problems of early life. The advisability of forming in Canada a special society for the study of the diseases of infancy and childhood has been questioned. Many consider that the better plan at present would have been to form a section of the general association. All recognize that paediatrics is only a department of general medicine, but it is a department that has to do with the whole body, not merely with a special organ affected to a great extent by disturbances in the general system which must ever be recognized as playing a predominant part. Nevertheless the body in early life has many peculiarities of its own and differs from the adult in its anatomy, physiology and pathology, and presents many special features of great interest and value for the biologist as well as to the physician. Infants and young children are not merely miniature men and women. The work accomplished during the past thirty years by the members of the American Paediatric Society and the influence exerted by the researches and writings of its members have greatly increased the interest of the general profession in the problems of child life, and have placed America in the van of other countries in all the activities connected with child welfare. We look forward to our Canadian Society effecting equally good work.

Until the present year the development of an appreciation by the profession of the importance of the special study of the many problems of child life has been extremely slow and it is only within the past two decades that the claim of paediatrics to be a department of medicine demanding special training and special clinical facilities has been recognized in university calendars. Nevertheless, an awakening to its importance has taken place, and every university of good standing has now its special paediatric staff.

The character of the papers presented at this first meeting of the Society augurs well for its success. All were of a high order of merit and recorded not only carefully observed facts of importance but also, the results of scientific research in new ground.

We hope to print many of the papers in this *Journal* and we wish for the Society a career of much usefulness.

INDUSTRIAL COLONIES FOR TUBERCULOSIS

All those interested in the treatment of tuberculous patients have been watching the success of the method as carried out by Dr. P. C. Varrier-Jones at the Papworth Industrial Colony, Cambridge, established some years ago. In a recent number of the *British Medical Journal* some quotations are given from an address by Dr. Varrier-Jones at the Englewaite Industrial Colony, Cumberland. Varrier-Jones some years ago saw that his advice to patients to work at "a light job" or to eat "a generous diet with plenty of cream" was not sufficient and not even possible if the patient were to think of earning a living wage. He began to look about for a means of allowing the patients to live under conditions in which disease, partially arrested in a sanatorium, could continue to be arrested during the remainder of their days.

The consumptive workman had to be subsidized and this is done at Papworth by the friendly societies and the Cambridgeshire After-Care Association. This subsidy is an insurance by the community against infection. The patients are engaged in such work as poultry farming, carpentry, cabinet making, etc. Tuberculosis is treated at Papworth down to its very base—the home—for the wives and families of the men are there. It is gratifying to note that so far there has not been one case of infection.

This *Journal* extends its congratulations to Dr. Varrier-Jones and other heads of Industrial Colonies upon their achievement in helping to solve the social and medical problem presented by the tuberculous. A. M.

Correspondence

IN MONTREAL—AT THE ANNUAL MEETING

To the Editor:

The recent meeting of the Canadian Medical Association in Montreal was signalized by one new departure, the substitution to a large extent of hospital clinics for the usual forbidding array of papers. The warm month of June, following the dreary winter of work, calls us to merrier things than a crowded hall and cold—not cool—scientific subjects inaudibly set forth; and particularly is this so in the merry city of Montreal, P.Q. Rather for us the 19th hole than the 16th amendment, and the grassy brassie than the hardwood of the meeting-room. Under the handicap of this somewhat general sentiment, the Programme Committee made a splendid recovery when they put on the hospital clinics, with the patient and operation as drawing cards, and put off the typewritten stuff. The "dry clinic" of Sir Robert Jones, though held in the hotel, was really a hospital clinic, and was very far from dry. Only in the matter of the two or three symposia was formal talking from prepared papers allowed, and these, fortunately, were so well chosen for their practical bearing upon every day problems of the general practitioner that they held the interest of a large group of the members. We must congratulate the Programme Committee, and would suggest that when the meeting is held in any large city the example of the Montreal men might well be followed.

Sir Robert Jones' clinic on a great variety of orthopaedic subjects was the particular triumph of the whole meeting. It is briefly reviewed in another column. Suffice it to say here that the illustrious Welshman maintained his reputation for complete knowledge and brilliant exposition, and increased, if possible, his universal popularity. To see him wangle that club foot into position was a minor revelation. In the matter of twisted limbs he is in himself The Compleat Wangler. Was Izaak Walton a Welshman?

The writer naturally could not attend all the clinics; but the programmes prepared by the various hospitals sounded most attractive. The attendance at each hospital, considering the very considerable splitting up, was encouraging, at any rate from 10 o'clock on. Nine o'clock (let us frankly admit it) is an early hour, in the eyes of those who come partly for the holiday, and who have dined well the night before; and those of the hospital staff who thought that members might arrive at a clinic at 8 a.m., suffered presumably a quite justifiable disappointment.

Never before has one so desired a magic carpet, or a multiple and divisible personality, each clothed with its proper body. One wanted to be in several places simultaneously. Yet this lack was partly remedied by much conversation, and opinions seemed to be unanimous upon the excellence of all the demonstrations and clinics. It was obvious that a special effort had been made to present the latest information upon the every day subjects that appeal to the general practitioner, and to avoid taking up the precious time of the meeting with the rarer forms of disease and injury. This was particularly shown in the choice of subjects for the symposia. It was pleasant to note that the clinics of our French colleagues were largely attended, and the Association is to be congratulated upon their recent accession to the work of the National Association. They have much to show us that is peculiar to their school of education, and, especially in the matter of treatment much that is new and valuable to us.

Sir William Taylor contributed a useful paper on intestinal obstruction, in which he emphasized anew the incomparable importance of early diagnosis and early operation. In no other way could we reduce the dreadful mortality rate which, he stated, remained still in some clinics around fifty per cent. In favour of the policy of early and active intervention such as he had long followed, he cited his own figures of those deaths in eighty cases. Sir William is to be congratulated on such extraordinarily brilliant results,—results which should remind the practitioner most forcibly of his responsibility toward all patients in whom obstruction is suspected, and of the advisability of particularly early operation.

The symposium on infections and trauma of the hand, was especially interesting to nearly all the members, who are all often called upon to treat these somewhat dangerous lesions. A short review of this discussion appears elsewhere.

The number registered was much larger than at any previous meeting. Including the ladies, there must have been close on to one thousand present. Montreal has set a record, and I believe I follow the general sentiment in saying that the meeting as a whole was a huge success.

ONE OF THE SEVEN HUNDRED.

Highlands, June 20th, 1923.

Caffein Intravenously—The Best of Stimulants.—Caffein, as a temporary stimulant given intravenously, is the one and only drug which in the experience of W. W. Duke, Kansas City, Mo., never completely fails. If given subcutaneously, however, it fails as do other stimulants. He reports the case of an old man with bronchopneumonia who suddenly took a turn for the worse and became apparently moribund. He was practically pulseless. Breathing was of the Cheyne-Stokes type and laboured during the periods of dyspnoea. Large, coarse, tracheal râles were audible throughout the ward, owing to accumulation of mucous in the trachea. The patient had been given strychnine, atropin, camphorated oil and strophanthine intravenously, and had shown no response to them whatever. Duke then gave 2 grains of caffein sodiobenzoate intravenously. The patient opened his eyes almost immediately and began to talk. He began to breathe regularly and deeply, and was troubled no further with mucous in the trachea. The pulse became strong and regular. This lasted until the following night, when he again lapsed into the state described and passed away, this time in spite of further use of caffein. This experience has been repeated many times by Duke with almost equally good temporary results. The drug has been used in moribund cardio-renal cases; in uremia associated with coma; in prostate cases with ascending infection; in uremia and coma; in bronchopneumonia with coma, and in general sepsis with coma. The result in the majority of cases has been temporary, and while the drug has often been repeated two or three times with good effect, the later doses have rarely been as effective as the first. In one case, however, caffein was repeatedly used with the result that the patient recovered from an illness which Duke is convinced otherwise would have almost certainly terminated fatally.—*Jour. Am. Med. Assoc.*, April 7, 1923.

Asthenopic Reflex Manifestations Between the Eyes and Teeth.—Relief of eye strain and its manifestations through refraction in made impossible by diseases of the nose and its sinuses and of the pharynx and, rarely, by more remote diseased organs is the assertion made by W. W. Kahn, Detroit. These diseases influence reflexly the functions of the eye. Such sources of malfunction, when unsuspected, keep the oculist uselessly trying for years to cure the asthenopia until, finally, the cause of these reflexes is discovered. Nine such cases are reported. That the nerves which acted as conductors in producing eye reflexes due to bad teeth may also act as agents in producing tooth and gum reflexes due to strained eyes is shown by five cases cited. The nerves that are principally involved in these reflexes are the three divisions of the trigeminal nerve, supplying in part the eye and the teeth. This common innervation makes it obvious that the irritation of one of the many branches of the trigeminal nerve may produce the most varied and unexpected reflex symptoms. The teeth causing eye reflexes usually do not cause local pain and are, therefore, commonly overlooked as causative factors. Toothache and numbness of the gums may be caused by eye strain as easily as eye strain may be caused by bad teeth. There are at least four groups of reflexes manifested in the eye, of which only the least important is caused by live pulps and the three important ones by dead teeth and alveolar abscesses. The irritation of the sympathetic nervous system by abnormal teeth may cause neurasthenia and possibly, in susceptible cases, even insanity. The infected apexes and alveolar processes are, as a rule, not curable by local treatment. Extraction is the method of choice.—*Jour. Am. Med. Assoc.*, April 21, 1923.

Abstracts from Current Literature

MEDICINE

The Heart in Diphtheria. Loth, Mathilde. *Arch. of Int. Med.*, May 15, 1923.

The series of cases on which this paper is based is small. But the problem is well stated. Clinical evidence shows that death in diphtheria is largely due to circulatory failure, but there is not complete agreement of views on the point of attack; is it the cardiac muscle and its conducting system, or is it extracardiac? The stage at which death occurs is to be reckoned with: where it is early the vasomotor medullary centres are said to be affected, later on interstitial myocarditis is found. Less hard and fast is the view that heart failure during or after diphtheria is not always due to the same cause, but that toxic myocarditis seems to be a large factor.

Experimental work on dogs has shown, however, that the work of the diphtheria poisoned heart is quite as good as that of the normal heart. And yet another worker found that up to a very short time before death the heart appeared to function normally, but that the collapse and death followed on failure of the peripheral blood vessels.

Clinical findings as regards the effect on the heart are less disputed, although the percentages given differ somewhat. Only a relatively small number of cases show serious heart symptoms, but where the cardiac mechanism has been seriously disturbed the outlook is usually extremely grave. One observer in a study of eighty cases concluded that the outcome was usually fatal.

The electrocardiograph affords an accurate estimate of the irregularities. But opinions differ as to the degree of myocardial involvement necessary for such results. Some say that anatomical damage to the myocardium is not necessarily present in gallop rhythm and extrasystoles; others as definitely hold the contrary view. A compromise is reached in the view that lesions of myocardium may cause no symptoms, but the least changes in the bundle do.

A summary of 220 fatal cases showed degeneration of myocardium to be one of the commonest conditions present. Its simplest form was fatty degeneration, which occurred chiefly in short, severe cases. More prolonged cases showed increasingly severe degrees of muscular degeneration.

The present series consisted of nineteen out of sixty-five fatal cases. The average age of death was 3.6 years; average day of illness on which admitted, 5.8. Antitoxin had been given in all but one before admission. Average duration, 10.8 days. The involvement of the heart, therefore, occurred rather early. The pathological findings showed, in no case, a definite myocarditis, *i.e.*, a true inflammation—there was "more or less cloudy swelling" and fat accumulation and slight increase in interstitial cells.

A series of hearts was studied in cases of severe infections other than diphtheria, and in these, too, a slight increase in cellular elements was found, without any definite inflammatory reaction. Finally, a normal series was examined pathologically, and again a slight increase of interstitial cells was found.

The comparison of findings pointed to quantitative rather than qualitative differences.

Some experimental work on guinea pigs showed that diphtheria antitoxin produced degenerative changes in the heart muscle of the same nature as those found in fatal human cases, but at no stage a definite inflammatory reaction.

H. E. MacDermot

Determination and Interpretation of Lung Volumes in Certain Heart Lesions. Lundsgaard, C., *Jour. A.M.A.*, Jan. 20, 1923, LXXX, 163-167.

The various lung volumes, "residual," "reserve," and "complementary" air, and "total," "middle" and "vital" capacity, are defined and their range of normal variations is presented in tabulated form from studies carried on in Professor Faber's clinic in Copenhagen. The author then proceeds to discuss the changes that take place in each of these several volumes in heart disease. Vital capacity is measured by the ordinary spirometer. Changes in vital capacity depend upon variations either in the total capacity or the residual air, and a knowledge of these is, therefore, important. These volumes are estimated by one of the common dilution methods (breathing in and out of a closed bag). The values so obtained are expressed in terms of percentage of the normal values of the individual calculated from the size of the chest wall, after correction for diminished excursion of chest has been made. Eleven cases of heart disease studied in this manner are presented. The total capacity was normal in the incipient stage, decreased in the later stages of compensation and still further decreased when decompensation occurred. Vital capacity decreases progressively from the onset up to and throughout the stage of failing compensation. Residual air at first rises and remains up during the entire stage of compensation; after decompensation occurs it is decreased, owing to the increase in the fluid contents of the chest, particularly of the alveoli. The conclusion is drawn that in heart disease the vital capacity cannot in the course of effective treatment return to normal, because even if the total capacity becomes normal, the residual air remains increased on account of the increased pressure in the pulmonary circulation. M. E. Abbott

On the Technique of the Determination of the Velocity of the Arterial Pulse Wave.
Lundsgaard, C., and Beyerholm, O. *Arch. of Int. Med., Jan.,* 1923, XXXI, 55-62.

The "hot wire" apparatus of Tucker and Hill for registration of the pulse and heart beat on the electrocardiograph suggested to the authors the idea that the camera of this instrument might be employed to record the curve of the arterial pulse at the same time with the electrocardiogram, and thus supply a means to study of the velocity of the wave. Two arterial receivers are applied, one to the carotid, the other to the radial artery. The latter is of the spring variety used by Mackenzie, with rubber straps attached to the support to prevent its slipping. The carotid receiver is an ordinary metal tambour with a long shank and in its centre a small metal knob for application to the artery. The photographic plate or film must move with a speed two or three times that for recording electrocardiograms alone. The arrangement has the advantage of indicating to what phase of the contraction a different heart wave corresponds, and is very useful for correlating the velocity of arterial waves in various forms of arrhythmia. Several such combined curves are reproduced in the paper. The results of a series of observations on both healthy and diseased patients will be communicated later. M. E. Abbott

The Production of Heart Murmurs.
Reid, W. D. *Am. Jour. Med. Sc.*, March, 1923.

This excellent paper deals with the history of the subject, with experiments performed by the writer, and with the clinical and pathological data obtained from eighty cases at the Boston City Hospital, in 1921. Great praise is given to the interpretation which M. A. Chauveau, of Lyons, placed upon his own experimental work of 1858.

The writer's conclusions may be summarized as follows: A murmur is most readily produced where a *veine fluide* or jet is formed as in, (1) a stenosis or narrowing of the vessel, and (2) a sudden increase in its calibre. A certain velocity of the stream is necessary. The loudness or intensity of the murmur is, within certain limits, proportional to the velocity of the stream. The murmur is propagated both up and down stream, but better in the latter direction. A murmur is readily caused by a cul-de-sac in the wall of the vessel facing the current and even a sharp edge or lip is enough to cause a murmur. The murmur produced by the cul-de-sac is not so intense as that associated with a *veine fluide* and it is transmitted better up than down the stream.

It would appear that roughness of the inner lining of the tube does not cause a murmur, or, if it is present, it is very slight and in no sense comparable with the murmur produced by a *veine fluide* or by a cul-de-sac facing the stream. Earlier observers were not in agreement about the influence of roughness of the vessel wall and in experiments great care must be exercised not to cause a stenosis as well.

Conditions for the formation of a *veine fluide* or cul-de-sac may be, and often are, present together in the human heart. The quality of the murmur is influenced by the character of the vessel wall at the site of its production. Resonance, reflection, and refraction of sounds may alter murmurs in their transmission. Finally, Reid concludes that a murmur is not mysterious phenomenon incapable of explanation, but is one kind of sound and that it is subject to the general physical laws of sound.

Archibald Malloch

The Common Sources of Error in Lung Examinations. Duncan, E. A. *Jour. A.M.A.*, April 28th, 1923.

In the author's opinion, erroneous diagnoses of pulmonary tuberculosis are almost always based upon description of non-existing or misinterpreted physical signs. A sign of increased density especially at the apices is not sufficient in itself for the conclusion that the case is one of tuberculosis. This applies to alterations in fremitus, changes in the percussion note, and to abnormal breath sounds.

Normal differences of the two sides must be borne in mind. Fremitus is normally greater over the whole of the right lung than over the left. The percussion note is shorter and of a higher pitch over the right apex than over the left one. Normally there is broncho-vesicular breathing from the right apex down to the second rib in front and to the third dorsal spine behind. Duncan says that the prolonged expiration of this type of breathing is lower in pitch than inspiration. In bronchial breathing, however, inspiration is roughened and expiration is prolonged and of equal pitch or even of a higher pitch than inspiration. To provoke or produce moist râles it is important to reduce the pulmonary volume and flatten out the bronchioles by expiration, get the patient to cough, and, finally, to inspire. Care must be taken to exclude extrapulmonary noises such as muscle sounds, sounds made at the sternoclavicular points, sounds made by the patient swallowing, and sounds made at the margins of the lungs. Basal bronchitits without involvement of the upper lobe must be proved to be tuberculosis by the laboratory before such a diagnosis can be made. ARCHIBALD MALLOCH

The Modification of Gastric Function by Means of Drugs. Bennett, T. I. *Brit. Med. Jour.*, March 3rd, 1923.

This paper, read before the Section of Therapeutics and Pharmacology, Royal Society of Medicine, October, 1922, deals with the influence of a number of drugs on gastric secretion and motility The effects of a drug on secretion is illustrated by fractional gastric analysis curves made before and after administration. The effect on motility is shown by reproductions of plates of an opaque meal taken first before, and again after, the administration of the drug to be tested

Atropine shows a definite effect in diminishing secretion and this was most marked when given by mouth, or when the stomach was washed out with a weak solution. Pilocarpine causes increased secretion, but this was often masked by the profuse salivation which it produced. Alkalis were found to have a neutralizing effect in acid secretion when given some time after a meal, but if given before or at the same time as a meal it was found that they were first neutralized and then caused an actual increase in acid.

The administration of hydrochloric acid was found to be of value, but had to be given in large doses. Its chief value seemed to be that it stimulated closure of the pylorus and so prevented too rapid emptying of the stomach in cases of achylia and that it was a good antiseptic. The chief value of the bitters seems to be in the stimulating effect of the alcohol which they contain.

In the study of motility it was found that atropine delayed the emptying time of the stomach and pylorospasm and reflex hour glass contraction could be caused to disappear under full doses. Strychnine in small doses caused diminution in the emptying time of the stomach, but larger doses caused a spastic condition of the pyloric portion and delayed emptying time. The local action of adrenaline on gastric secretion and motility was also investigated, but although strength up to 1 in 5 were used, no evidence of any action was observed. R. H. M. HARDISTY

The Permeability of the Intestinal Mucosa to Certain Types of Bacteria, Determined by Cultures from the Thoracic Duct. Williamson, C. S. and Brown, R. O. *Am. Jour. Med. Sc.*, April, 1923.

It is an important question "how do bacteria from the digestive tract or peritoneal cavity cause pulmonary infections?" The authors have carried out some experiments with dogs, the result of which clear the ground, so to speak, a little Under aseptic conditions a thoracic fistula was produced by exposing the junctions of the thoracic duct, internal and external jugular veins. The vein was ligated between the entrance of the duct and the heart, the internal jugular was ligated, the external jugular was tied, cut, and a catheter introduced into its proximal end and brought out through the skin of the neck and the end of the vein sutured to the skin. In a few days the catheter was removed leaving a patent fistula through which lymph flowed from two to four weeks.

The non-pathogenic *bacillus prodigiosus* (not commonly found in the laboratory) was used in saline suspension for the experiments. It was not possible to recover the organism from the fistula by culture of the lymph after ingestion of the organisms. The negative results were not influenced by diet or by trauma due to exposure of the viscera or to standard operative procedures. To exclude the possibility that the hydrochloric acid of the stomach destroyed the organisms, the saline suspension was introduced into a jejunal fistula, in a series of animals the results were again negative. Cultures of the faeces for the ingested bacteria were negative.

On the other hand, in fifty per cent. of the experiments positive cultures were obtained from the thoracic duct fistula following the injection of the organism into the peritoneal cavity.

It will be seen that in the above experiments it was not possible to rule out a destructive action of the digestive juices below the jejunum. Again, the disappearance of the organisms may, perhaps, be accounted for by their absorption through the intestinal villi into the blood stream. This point was not investigated.

Archibald Malloch

SURGERY

Cranial and Intracranial Endotheliomata—Haemicraniosis. Penfield, Wilder G. *Surg. Gynaec. and Obstet.*. May, 1923. Vol. 36, No. 5, p. 657.

This is a paper on cases of intracranial neoplasm associated wuth exostoses of the skull. In 420 cases of brain tumour occurring in the service of the National Hospital for Paralysed and Epileptic, London, ten showed a bony prominence of the skull immediately beneath which lay the tumour. Seven were operated on by Sir Victor Horsley and two by Mr. Percy Sargent. In nine, microscopical studies were made and nine similar cases were found reported; those by French authors under the name hemicraniosis. Cases cited of endothelioma of skull continue for years, ten years, three years, ten years, two years, ten years, ten years, etc., before neurological symptoms appear. They present first only signs of irregular bony growth followed by neurological symptoms due to increased intracranial pressure and encroachment on the brain.

Recoveries are noted, patients alive and well and working, sixteen years, twelve years, etc., after operation where bone, dura and subdural tumour masses were removed. A review of the literature with cases reported from 1883 to 1920 follows the ten case histories given in detail from the National Hospital. Sarcomata perforate the skull and differ from the endotheliomata originating in the dura, which infiltrate the bone and cause overgrowth and bosses. Endotheliomata are more common than sarcomata and many of the latter so reported are really endotheliomata. A certain number appear to follow skull traumatism, two out of ten in this series; trauma preceded bony tumour in one by seven years. Of six operated on, three recovered, one to die later from plastic operation, two died from haemorrhage and one from pneumonia. These six occurred in the eleven cases reported in the literature; nine cases were operated on of the ten National Hospital cases, four died, the latest seven weeks after operation from sepsis, two within thirty-six hours, one twelve days after. Five were discharged cured, two were not traced, three are living. Early operation is indicated and offers perfect results, if the intracranial tumour masses are not extensive, or if there is not *typical bony swelling and pain beneath*, usually of a stabbing character. Tumours occur chiefly in frontal, temporal and parietal regions, none are recorded in the occipital region. They originate from the arachnoidea or inner layer of the *dura mater*, displacing, without infiltrating, the brain.

Chas. K. P. Henry

The Conservation of Muscles in Paralytic Deformities of the Foot. Roberts, P. W. *Journ. of Bone and Joint Surg.*, Jan., 1923. Vol. 5, No. 1, pp. 123-126.

The writer points out that a muscle which does not function after poliomyelitis is not necessarily permanently paralyzed, but may be suffering from overstretching, a remediable condition; also that where a group of muscles is supplied by the same terminal nerve no one member of the group is likely to be completely paralyzed if the others have good power.

He quotes the case of a school teacher with apparent paralysis of the calf muscles, whose lameness was cured by shortening the tendo Achilles and protecting it from strain for a year. The paralysis was due to overstretching and was cured by giving the calf muscles a chance to regain strength. A second case concerns paralytic equino-varus for which astragalectomy was advised. Here the foot was strengthened by lengthening the tendo Achilles and removing a wedge of bone from the outer side of the foot with marked return of power. J. A. NUTTER

Synovectomy in Chronic Infectious Arthritis. Swett, Paul P. *Journ. of Bone and Joint Surg.*, Jan., 1923. Vol. 5, No. 1, pp. 110-120.

The writer describes cases in which he has dissected out diseased synovial tissue from knee joints hopelessly infected, going in where the swelling was greatest, closing without drainage and using no fixation. It is held that removal of diseased tissue would promote joint function, and also that the diseased synovium was likely a source of infection in itself. The results have been good, save in one case where the joint cartilages were ulcerated. Painless function was restored in the operated knee joints, though in several cases the operation needed repetition. The cases were, in general, those showing apparently hopeless involvement of many joints, where removal of all possible foci of infection had been done. By removal of the diseased synovial membranes of the knees not only were these joints restored to painless motion, but the patient's general condition was improved and often permitted a return to ordinary work. No definite information was got from culturing the synovial fluid or the diseased tissue. Cases of hypertrophic or atrophic arthritis are not to be operated on, nor those in which the cartilages are involved. J. A. NUTTER

Osteochondritis Dissecans. Freiberg, A. H. *Journ. of Bone and Joint Surg.*, Jan., 1923. Vol. 5, No. 1, pp. 3-16.

This disease, known chiefly in the knee joint as a source of loose bodies, is discussed as a typical joint lesion. Five cases are reported, four in the knee and one in the elbow. Trauma is shown to be unnecessary or slight; the X-rays reveal a characteristic defect in the internal condyle bordering on the intercondylar notch, from which origin one or several pieces of bone arise, at first pedicled, later free. The symptoms in the knee are those of a loose body, with limitation of full extension, and disability on walking. It is not seen in childhood. Trauma, which is insisted on by some, must in any case be of an indirect nature. The treatment is surgical, involving the removal of *all* loose pieces of bone, which will have been found to have been exfoliated from the defect or niche mentioned above, which niche is always in the same position, varying only in size. The process of exfoliation seems due to an infarction, but what causes the infarction is not yet settled, whether fat embolism or otherwise. It is in the region of the *arteria genu media* ramifying on the posterior crucial ligament, and the writer inclines to the belief that an abnormally long tubercle of the tibial spine may injure the artery in certain positions.

J. A. NUTTER

Artificial Nerve Branches for Innervation of Paralyzed Muscles. Stookey, Byron. *Arch. of Surg.*, May, 1923. Vol. 6, No. 3, p. 731

In a series of experiments upon five dogs the musculocutaneous nerve was cut immediately distal to its formation, the central end tied with silk and implanted in the pectoralis major muscle, thus producing a paralysis of the biceps. A 3 cm. segment of a cutaneous branch of the ulnar nerve was completely freed, one end implanted into the main trunk of the ulnar nerve through a transverse incision, and the other end implanted directly into the substance of the biceps muscle.

The results indicate that it is possible by this means to re-innervate a paralyzed muscle.

The conclusions are based on the subsequent contractions of the muscle, on the normal size, colour and striations of the muscle, and above all on the finding of nerve branches and nerve fibres in the muscle thus innervated. F. J. TEES

A Method for the Localization of Brain Tumours in Comatose Patients. Dandy, Walter E. *Surg., Gynaec. and Obstet.*, May, 1923. Vol. 36, No. 5, p. 641.

There are two sites, the brain stem and the left temporal lobe, where extirpation is not possible or justifiable. Otherwise, extirpation of brain tumours is to be carried out as it is the only cure. The location of brain tumours can usually be determined even in unconscious patients, the character only at operation. Neurologically and roentgenologically, only fifty per cent. of brain tumours can be localized, most of the balance can be localized pneumographically. In emergency the latter is not possible and the author describes the only available method of localization in unconscious patients, *viz.* the estimation of the size, position and intercommunication of the cerebral ventricles by aspiration of the fluid in the lateral ventricles. Practically all intracranial tumours alter the size, position and shape of the ventricles in some degree. Ventricular puncture determines alteration in position, aspiration of fluid changes in size, and injection of a dye the intercommunication of the various parts of the ventricular system. Such a procedure will determine whether a tumour is above the tentorium or not, and if above, in which hemisphere, often in which pole. Puncture is done in the occipital region because (a) the largest part of the ventricle is here, the vestibule, (b) it is the most easily reached, and (c) is less easily collapsed or dislocated. Both ventricles must be punctured. Puncture should reveal abnormalities in position and size by variation in direction of needle and its depth when the ventricle is reached. A failure to reach either ventricle throws out hydrocephalus due to growths in the third ventricle, brain stem or cerebellum. Fluid aspirated and measured determines the size, 25 c.c. or over indicates a dilated ventricle. Where dislocated, the brain tumour is always on the side from which the dislocation has occurred. If shown by posterior puncture the tumour is in the posterior half of the cerebral pole. The lateral ventricles are normally equal, the smaller one on puncture is on the side of the tumour. A ventricle which gives 25 c.c. of fluid has no tumour in the containing cerebral hemisphere. To determine intercommunication, 1 or 2 c.c. of indigocarmine are injected into first ventricle punctured and second punctured and fluid noted. If no dye passes, the tumour is in the anterior or middle fossa. If both are dilated and the fluid passes, it is in the posterior fossa. If due to obstructive hydrocephalus, no dye is obtained on lumbar puncture. The dye test will eliminate tumours of the pituitary, third ventricle and some of the pineal body. With the dye test practically all tumours in the posterior fossa can be found at operation. If both ventricles are dilated and dye is found at a subtentorial decompression in quantity, there must be a communicating hydrocephalus and no tumour. A series of six cases of brain tumour, occurring in patients in coma, is given, illustrated by diagrams, ventriculograms and photographs. The method does not supplant ventriculography, but offers an emergency diagnosis, and by relief of intraventricular pressure offers the best aid for immediate operative relief in otherwise hopeless cases. CHAS. K. P. HENRY

ANAESTHETICS

Clinical and Statistical Account of Spinal and Local Anaesthesia, as Practised at the Garrison Hospital at Aquila. Ciaprini, Gino. *Il Policlinico*, Jan. 22, 1923.

The writer thinks that the dangers of spinal anaesthesia have been much exaggerated. He has used it in 286 cases. In 284 he used stovaine and in two, novocaine. Pallor, sweating and vomiting occurred in fifty-three cases, but there were no deaths. In twenty-six cases, the first injection failed, but a second and successful one was made at once. The failure of the first injection in these cases was found to be due to chemical change in the stovaine. In one case it was found impossible to reach the spinal canal with the needle. Where novocaine was used no anaesthesia was obtained and both patients suffered afterwards from severe headache, high fever and vomiting. One of these cases had, in addition, delirium and cardiac arrhythmia. The headache and fever lasted for three days.

These symptoms were not thought to be due to any chemical change in the novocaine as it was used subsequently in both cases for local anaesthesia with satisfactory results.

There were two cases of paraplegia after the use of stovaine, one coming on in two, and the other in three weeks after operation. They both lasted about a month, and ultimately recovered completely.

Local anaesthesia was used in 105 cases. In twelve of these stovaine was used. It was discarded owing to its tendency to cause necrosis.

W. B. HOWELL

High Grade Choked Disks in Epidemic Encephalitis.—William G. Spiller, Philadelphia, reviews the literature to determine what has been published concerning choked disks in epidemic encephalitis, and reports two more cases which came under his observation.—*Journal A. M. A.*, June 23, 1923.

News Items

GENERAL NEWS

Dr. A. D. Blackader, editor of the *Journal*, sailed on July 8th, for a short holiday in England. All communications relative to editorial matters should be addressed "Care of The Canadian Medical Association, 836 University Street, Montreal."

The Association suffered a severe loss in the untimely death of Lt. Colonel William Malloch Hart, M.C., M.D., who died in Ottawa last month.

In the leaflet headed, "Canadian agencies for the diagnosis and treatment for tuberculosis," interesting figures on the tuberculosis problem are given; these figures include the population of each province, the death rate per 100,000 from tuberculosis, the number of sanitaria and details of their equipment; interesting notes are given in regard to the existence of clinics devoted to diseases of the chest, open air schools, and diagnostic laboratories. In addition to these details, the grants of the various provincial governments are stated.

It is interesting to see that the prairie provinces, Alberta and Saskatchewan have the lowest death rate from tuberculosis, fifty-two and forty-three deaths per 100,000 of population. Prince Edward Island, Nova Scotia, and Quebec, with 143, 134, and 122 deaths per 100,000 make the worst showing of the provinces. New Brunswick shows 104 deaths per 100,000, British Columbia 78 deaths per 100,000, Manitoba 69 deaths per 100,000, Ontario 71 deaths per 100,000. One realizes that in the prairie provinces the low death rate may be partly accounted for by the fact that only the very fit attempt life in these provinces; the high death rate in Prince Edward Island, Nova Scotia and Quebec as compared with Ontario is very striking. There are 2,000 sanitaria beds in Ontario as against 513 in Quebec, and Ontario's grant was $280,000 as compared with $135,000 for the province of Quebec. In sanitaria, clinics devoted to diseases of the chest, diagnostic laboratories, and in special accommodation for tuberculous patients amongst the insane, Ontario is easily in the lead. The leaflet is compiled by the Canadian Tuberculosis Association, printed by the courtesy of the Federal Department of Health. Further information is available from the secretary, Bank Street, Ottawa.

A postgraduate medical course on the diseases of infants (*Cours de Perfectionnement Clinique et de Médecine des Enfants*) will be held in Paris during August and September at the Hôpital des Enfants Malades, 149 rue de Sevres, under the direction of Professor Nobecourt and Dr. Lereboullet, with the assistance of other well-known physicians. The course includes lectures and demonstrations upon diseases of all the different systems and laboratory and x-ray work. The fee is 150 francs. A certificate of attendance will be given at the end of the course.

The Canadian Tuberculosis Association met in the University of Alberta, on June 12th. The first morning session was occupied by papers contributed by Drs. Jarry, Torrance, Logie, Vrooman, Leclerc, Boughton, Ritchie, Adamson, Ogden and Baker. In the afternoon there was a joint meeting with the Canadian Public Health Congress. Dr. J. H. Holbrook addressed the meeting. In the evening, directly after dinner, there was a business meeting followed by the President's address. At the joint public meeting in the evening, Dr. Parfitt addressed the gathering. On Wednesday morning clinics were held in the wards of the University Hospital, and in the afternoon a joint meeting took place with the Public Health Congress, which was addressed by Dr. D. A. Stewart, of Ninette, Man. The following morning was devoted to the meeting of the Public Health Congress, and the meeting in the afternoon was addressed by Dr. C. J. Hastings. We hope to present to our readers many of the papers contributed to this very interesting meeting.

NOVA SCOTIA

At the annual re-organization of the Halifax Health Board, Dr. J. L. Churchill was re-elected Chairman.

Dr. George MacIntosh, of Halifax, who has been critically ill with septic infection of the right hand, is slowly recovering in the V.G. Hospital, after having had a serious surgical operation.

Dr. H. K. MacDonald and Dr. George H. Murphy attended the meeting of the Maritime Branch of the American College of Surgeons, on the 11th and 12th of May, at St. John, N.B.

Dr. J. G. MacDougall, of Halifax, Dr. Ross Miller, of Amherst, and Dr. I. M. Lovitt, of Yarmouth, returned recently from their seven weeks' trip to South America with the Fellows of the American College of Surgeons. Dr. MacDougall, being a Vice-President of the organization, presided at various meetings along the way, and was made a Fellow of the Academy of Medicine, Rio de Janeiro.

The Provincial Department of Health announces in *Public Health Notes* for May, that plans have been completed for a monthly tabulation of birth and death statistics with a fairly complete summary, to be kept well up to date. This will be of great help to the medical profession and to public health workers.

The annual meeting of the Colchester and Hants Medical Society was held in Truro on the 31st of May, and elected the following officers: President, Dr. F. F. Eaton, Truro; Vice-President, Dr. A. R. Reid, Brooklyn; Secretary-Treasurer, Dr. H. V. Kent, Truro; Executive Committee, Dr. C. H. Morris, Windsor, and Dr. R. O. Shafford, Londonderry.

The Sixteenth Annual Meeting of the Valley Medical Society was held at Digby on the 29th of May. Dr. DuVernet, as Mayor of the town gave the address of welcome. The newly elected officers are, Dr. A. S. Burns, Kentville, President; Vice-President for Annapolis, Dr. L. B. W. Braine, Annapolis; Vice-President for Digby, Dr. W. R. Dickie, Barton; Vice-President for Kings, Dr. M. R. Elliott, Wolfville; Secretary-Treasurer, Dr. C. E. DeWitt, Wolfville. The Society had a most interesting all day programme with seven o'clock dinner. Dr. Smith L. Walker, Associate Secretary of the Nova Scotia Medical Society and Provincial Red Cross Commissioner, Colonel H. A. Chisholm of the Provincial

Health Department, and Dr. Glen Donovan were present and delivered the addresses. The Medical Society placed itself on record as heartily in favour of a Ministry of Public Health in Nova Scotia.

Health Centre activities for the M.H.H.C. for the month of April, show a total of 2,140 families receiving guidance from the public health nurses and visiting house-keepers; 1,156 families are under the supervision of clinics, where they receive medical, dental, and nutritional guidance from the physicians in attendance. Ten hundred and thirty-one babies under two years of age, are being supervised in their homes. The clinic activities show a total of 930 medical, dental, and nursing consultations. In seventeen instances, the public health nurses found illness requiring the calling of a family doctor, and in eight instances, families who had been necessitous were discharged as now being able to return to their family physicians.

The Fifty-Ninth Spring Convocation of Dalhousie University was held on the 10th of May, when a new record was made by graduating the largest class of medical students in the history of the University. The names of those receiving degrees of M.D., C.M., are as follows:

Doctor of Medicine and Master of Surgery—Chase, Margaret Rebecca, B.A. (Acadia), Greenwich; Christianson, Phebe Kirsten, Halifax; Cochrane, Dara Mason, Fox River; Cochrane, Perry Stanley, Fox River; Cooper, Reginald Frederick Clough, Savanna la mar, Jamaica; Corbett, Herbert Redmond, Halifax; Davis, Edwin Cosman, St. John, N.B.; Dolan, Harold Sylvester, B.A., South Nelson, N.B.; Holland, Clyde Wallace, B.A., Halifax; Kinley, Cecil Edwin, Lunenburg; Levine, Maurice, Yarmouth; Lyons, Hubert Antoine, Kentville; MacLeod, Clement, Halifax; Medjuck, Abraham, Caledonia Mines; Murray, Foster Sproull, Leitche's Creek; Nickle, Frederick James, Malone, Ont.; Peppard, Stanley Harcourt, Pugwash; Pidgeon, Ira Sanborn, Halifax; Rowlings, David MacPherson, Musquodoboit Harbour; Wilson, Frank Gordon, Sydney.

Doctor of Dental Surgery—Thompson, Hazel Alice, Halifax; Blanchard, Frank Milne, Shelburne; Calkin, Victor Clyde, New Glasgow; Clay, Merrill Allan, New Glasgow; Climo, Charles Bryce Hannay, Halifax; Crosby, Hazlett Saunders, Halifax; Dooley, Cyril Jeremiah, North Sydney; Florian, Sydney Dillon, Sydney; Fluck, Walter Leon, Halifax; Heal, Harold Harcourt, Liverpool; Hogan, Michael Francis, Carbonear, Nfld.; Johnson, Karl Payson, Halifax; Macdonald, Norman Stanley, Grand Bank, Nfld.; MacIsaac, Stephen George, Sydney; McLellan, Adam Johnson, Noel Shore; Morrison, Michael Edward, River Bourgeois; Roop, Lionel Balmoral, Bear River.

Clyde Wallace Holland received the University Medal awarded by the Faculty of Medicine to the student making the highest average in his senior year and in the last three years of the Course. Dr. Holland is a graduate of the University in Arts, and served with distinction with the C.E.F.

In his Convocation address, President MacKenzie announced the appointment of Dr. Douglas McIntosh as the first Professor to the Chair of Chemical Research. This appointment is well received throughout the Maritime Provinces. Professor McIntosh has filled chairs with distinction at McGill University and in British Columbia, and for the last three years he has been doing industrial research work in the United States. At the conclusion of Convocation, Shirreff Hall, the new women's building for the University, was thrown open for inspection, and tea was served there by the Board of Governors. It will be remembered that Shirreff Hall was erected out of funds provided by the late Mrs. Eddy, of Ottawa. The new Bio-Chemical Building and Dalhousie Health Centre, both nearing completion, were also visited by friends of the graduates and the students, as well as the Science Building, the Law Building, the new Laboratory and the Gymnasium.

QUEBEC

Dr. Narcisse Lacerte, of Levis, has recently celebrated his sixtieth anniversary in the medical profession.

Dr. Giasson, who has been in New York for several weeks, has returned home.

Dr. Albert Paquet, who has been spending some weeks in New York and Chicago, has returned.

Dr P. P. Gagnon has returned from a several months' trip to Europe.

Dr. J. E. Leblanc, of 491 DeMontigny Street, Montreal, died last month at the age of sixty-nine years.

Dr. J. A. Ranger, director of the Provincial Hygiene Service, gave a lecture recently on venereal diseases, which was well attended.

Dr. J. A. Dubé has removed from St. Quentin, Restingouche, to Buctouche, N.B. where he will continue his practice.

Acting like soldiers on parade and offering not the least trouble, some 250 male inmates of the Ste. Anne Hospital for the Insane, Baie St. Paul, were marched out of the building at two o'clock in the morning when the north wing of the institution in which they were located was completely destroyed by fire, involving a loss of $150,000.

While the general situation at Mansonville is reported as improving, the typhoid epidemic has claimed its fourteenth victim..

Dr. Lesage, of Pointe Claire, died recently after a long illness. He had been practitioner in that town for twenty-seven years and was noted for his good work among the poor.

Dr. Henri A. Lafleur, of Montreal, has been nominated by the Governor General of Canada, to succeed the late Sir Thomas George Roddick on the Medical Council of Canada.

A new medical society, called the Montreal Clinical Society, has been recently formed. The following officers were elected: *President*, Dr. Norman Viner; *Vice President*, Dr. M. Rabinovitch; *Secretary-Treasurer*, Dr. Nathan Freedman; *Executive Committee*, Drs. S. Ortenberg, S. Eidlow, C. J. Gross, A. P. Ship and D. L. Mendel.

McGill University is sending a cordial address of congratulation to St. Bartholomew's Hospital on the forthcoming celebration of the eight hundredth anniversary of its foundation. The address will be conveyed by Dr. S. E. Whitnall, Professor of Anatomy at McGill, who will be the official representative of the university at the celebrations. The address, beautifully inscribed in Old English lettering on parchment and bearing the scarlet official seal of McGill, is the work of Professor Henry F. Armstrong, Associate Professor in McGill University.

Dr. Robert Wilberforce Mitchell, a well-known physician practising at St. Lambert, Que., for the past twenty-five years, dropped dead suddenly; he had been suffering from heart disease for the past few years, and knew that the end would come suddenly. He often told his friends that he expected to die some day while he was carrying out his duty. His sudden death came as a great shock to all his patients along the South Shore, where his kindness and geniality had brought him a host of friends. He leaves a widow and one son, Arnold Mitchell, at present a student in the dental faculty at McGill University.

The official announcement will soon be made by Bishop Gauthier of the opening of a campaign to raise the sum of $1,000,000 for the combined objects of rebuilding on a site in Notre Dame de Grace, the Hospital for Incurables, recently destroyed by fire, and of constructing, on the same grounds, an anti-tuberculosis hospital. The Sisters of Providence already have the grant of $150,000 given by the Provincial Government for the anti-tuberculous hospital, which was to have been constructed at Mont Lasalle, Maisonneuve. The Government has agreed to maintain this for the new, and more satisfactory, project now being put forward.

Dispensaries for the treatment of people suffering from tuberculosis in Quebec will shortly be established throughout the province, following a decision to that effect by the provincial Board of Health. The points where these dispensaries are to be established will be chosen with regard to the prevalence of the disease in that district. The scheme received the approval of the Hon. Athanase David, previous to his departure for Europe. The dispensaries will be located in hospitals already established, or in other institutions, as the Government does not intend to erect buildings of its own. School dispensaries are to be established, where nurses and doctors will be trained, in Montreal and Quebec. Later, this part of the scheme will probably be extended to other parts of the province.

St. Jean de Dieu Hospital for the Insane, celebrated its fiftieth anniversary recently. The care of the insane under the auspices of a religious corporation goes back as far as 1793, in which year, for the first time, the city made special provision for the care of its insane, by entrusting its work to the Grey Nuns. They relinquished this work, however, in 1844. Thirty years later, in 1873, the work was again taken up by the Sisters of Providence at the instigation of the Provincial Government, and the present hospital was established. At the first, the St. Jean de Dieu Hospital cared for all the insane of the city; the separation of the Protestant from the Catholic insane took place in 1890, when the first patient was received at the Protestant Hospital for the Insane at Verdun.

ONTARIO

MEDICAL ALUMNI ASSOCIATION

At the first Annual Meeting and Banquet of the Medical Alumni Association, University of Toronto, held in Windsor on the evening of Thursday, May 31st, at the Prince Edward Hotel, one hundred graduates of Toronto, Trinity and Victoria were present, and the gathering was marked by the deepest interest, groups of former college class-mates recounting incidents of former and recent times.

The President proposed the toast to the King. Dr. H. R. Casgrain, of Windsor, proposed the toast to the Alma Mater and this was responded to by Dr. B. D. Harison, Detroit; Dr. J. B. Kennedy, of Detroit; Dr. P. A. Dewar, Windsor; and Dr. George Young, Toronto.

The report of the Nominating Committee was brought in during the evening and was unanimously adopted as follows: Hon. President, Dr. A. Taylor, Goderich; President, H. B. Anderson, Toronto; Secretary-Treasurer, Harley Smith, Toronto; Vice-Presidents, B. D. Harison, Detroit; A. Moir, Peterborough; Wm. Macdonald, Windsor; J. N. Gunn, Calgary; R. H. Parent, Ottawa; A. D. Smith, Mitchell; A. A. Shepard, Sault Ste. Marie; R. T. Noble, Toronto; E. Davey, Hamilton; S. Stewart, Thamesville; Executive Committee, J. W. McCullough, Toronto; H. A. Bruce, Toronto; F. Marlow, Toronto; F. A. Cleland, Toronto; W. J. Macdonald, St. Catharines; J. W. Rutherford, Chatham; G. Stobie, Belleville; Hon. Dr. Manion, Fort William; D. Smith, Stratford; A. S. Tilley, Bowmanville; G. W. Ross, Toronto.

THE MEETING OF THE ONTARIO MEDICAL ASSOCIATION

The Forty-Third Annual Meeting of the Ontario Medical Association took place in Windsor on May 29th, 30th, 31st and June 1st, 1923. The first day was devoted entirely to business. A few figures in this connection are worthy of note. The business sessions lasted from 9.00 a.m. to 6.00 p.m., The Board of Directors and members of the Committee on General Purposes in attendance numbered 74; while the number of printed reports dealt with amounted to 23. At 7.00 p.m. on the first day, 98 members sat down to the Round Table Dinner, which was followed by a three hour Round Table Conference, presided over by Dr. A. J. Grant, of London, and at which 41 gentlemen spoke. The evening was pleasant and instructive. A great many problems of general interest to the medical profession were discussed. This Conference must be regarded as one of the most excellent features of the Annual Meeting.

The scientific sessions which occupied Wednesday, Thursday and Friday, were altogether successful. In all sections, 75 contributors presented papers, of whom 65 were Canadian practitioners; the great majority of this number being resident in Ontario. Dr. F. G. Banting gave the address in Medicine; Dr. F. W. Marlow, the address in Gynaecology; Dr. L. J. Austin, the address in Surgery.

The Association Dinner which was held on Wednesday night, was attended by upwards of 300. The Presidential address of Dr. Secord, of Brantford, of which we present an abstract in this number, was the main feature of the programme.

On Thursday afternoon, the entire Convention were the guests of Messrs. Parke Davis & Company for a four hour boat ride, which was thoroughly enjoyed. Thursday evening was given over to Alumni and Class reunions. Reports from all of these functions indicate that the various groups thoroughly enjoyed the evening. Among the outstanding and pleasant features of the Convention were the noon-day luncheons, the Rotary Club, Kiwanis Club and Border Cities Chamber of Commerce being hosts on the three days.

The Essex County Medical Society, under whose auspices the Association met, is deserving of the highest praise for the excellent manner in which the details of the meeting were arranged and carried out.

A *resumé* of the important business transacted at the meeting will later be published in the Journal. The Board of Directors elected for the ensuing year is as follows: *President*, Dr. J. F. Argue, Ottawa; *1st Vice President*, Dr. Geo. S. Young, Toronto; *2nd Vice President*, Dr. John Macgregor, London; *Hon. Treasurer*, Dr. G. Stewart Cameron, Peterborough; *Secretary*, Dr. T. C. Routley, Toronto. *Counsellors:* Dr. A. J. Grant, London; Dr. Weston Krupp, Woodstock; Dr. T. H. Middlebro, Owen

Sound; Dr. F. W. E. Wilson, Niagara Falls; Dr. Robert T. Noble, Toronto; Dr. E. A. McQuade, Trenton; Dr. L. J. Austin, Kingston; Dr. Hugh Laidlaw, Ottawa; Dr. Edgar Brandon, North Bay; Dr. J. I. Pratt, Port Arthur. The Forty-Fourth Annual Meeting will be held in Ottawa, in 1924, on the kind invitation of the Ottawa Medico-Chirurgical Society.

Twenty-five thousand dollars has been given to the Toronto General Hospital, Hospital for Sick Children, and to the University of Toronto, by John D. Rockefeller, Jr., for the purpose of prosecuting research in the treatment of diabetes by insulin.

Professor J. J. R. McLeod, of the University of Toronto, will attend the Physiological Conference at Edinburgh on July 24th, and will speak upon the development of the insulin treatment of diabetes. Dr. F. G. Banting will address the British Association of Surgeons in London, on the same subject.

The Western Ontario Academy of Medicine met on April 27th, at the Western University Medical School in London. Dr. Plummer, of the Mayo clinic, spoke on "Disease of the Thyroid," and Dr. Dean Lewis, of the Rush Medical School, Chicago, gave an illustrated lecture on, "The Diagnosis of Bone Lesions." The session was presided over by Dr. Charles H. Harris, president.

Official recognition of the valuable work of Dr. F. H. Banting and of Mr. C. H. Best, was taken by the local Legislature, and Bill was introduced by Premier Drury for the providing of $10,000 a year to prosecute further research on the Insulin treatment of diabetes. Dr. Banting has been made the professor of research medicine at the University, and Mr. Best, the assistant.

At the convocation of the University of Toronto, on June 8th, a portrait of the late Professor J. J. Mackenzie was unveiled and presented to the University. The portrait will be hung in the pathological building on University Ave. The presentation was made by Mr. I. H. Cameron, and received on behalf of the University by Sir Edmund Walker.

The Ontario Health Officers' Association met in Toronto on May 21st. The members were welcomed by Dr. J. W. S. McCullough, chief officer of the province, and were addressed by Dr. Paul J. Maloney, distict officer of health of eastern Ontario, and Dr. E. R. Secord, of Brantford, president of the Ontario Medical Association. In the meetings which took place on May 21st and 22nd, the cancer problem was discussed, and Dr. Banting spoke on the insulin treatment of diabetes. Mr. S. J. Manchestor, director of vital statistics, Registrar General's Department, addressed the meeting on, "vital statistics and cause of death." Industrial hygiene, maternity and child welfare, and venereal disease problems were discussed in the various sessions. Dr. T. A. Lomer, of Ottawa, was elected as president for the following year.

In connection with the meeting of the Ontario Medical Association at Windsor, the writer and other members of the Association wish to register a complaint as to the arrangements made. There has been an endeavour to establish an interest in pathology and bacteriology and the programme contained the details of the meetings of this section, meetings which were set for Thursday afternoon, May 31st; this was the time set for the river excursion and practically every member of the Association present took advantage of the opportunity offered to see the river fronts; the result was that there was no audience for the pathological section, and little or no audience for the regular section of paediatrics. Members of the pathological staff of Toronto, Queen's, and London Universities had prepared papers for the pathological section, and were very naturally disappointed that the arrangements made deprived them of an audience, nor can one say that they would be unreasonable if they failed to take an interest in subsequent meetings. Complaint might also be made of the arrangements which resulted in an audience of less than a dozen in the sections of medicine and surgery on Friday afternoon, June 1st. The suggestion is made that excursions or gatherings which are likely to take the greater number of the Association away should be left for the last hours of the Association meetings, for it would seem by this time that in a gathering of physicians from all parts of the province, the interest in medicine should precede all else, and we can rest assured that the surest way to discourage our best contributors is to have them appear in a hall kept empty by poor management on the part of the programme committee.

Sir Robert Jones, during his visit to Canada as the guest of the Canadian Medical Association, very generously acceded to the request of the joint Executives of the Western Ontario Academy of Medicine and the War Memorial Children's Hospital of London, Ontario, and gave of his time in the interests of the latter. Due to the efforts of these and other organizations as the Shrine and the Rotary Clubs, a stimulus has been given to the interest taken in the welfare of the under-privileged child who requires orthopaedic treatment. The hospital recently opened is intended, in part, to meet this and these other organizations are contributing their quota. It was to unify these several efforts that this mission was requested of Sir Robert Jones.

On arrival in London on June 14th, he made a brief preliminary inspection of the hospital and then addressed a representative audience at a luncheon. Dr. C. A. Harris, President of the Academy of Medicine, occupied the chair, and in his remarks expressed the thanks of the local organizations to the Executive of the Canadian Medical Association for their courtesy in sharing the privilege of host to the distinguished visitor.

In his remarks Sir Robert paid high compliment to organization for the erection of a hospital by voluntary contribution, and to the beauty of its design and the completeness of its arrangements. It was a worthy monument to noble deeds. Launching into the subject of childhood deformity, the speaker pointed out that in the ideal state when tuberculosis and rickets would have been conquered, many of the deformities would disappear. Prophylactic features of hygiene were stressed and the great need for inspection of the herds that supply the milk.

He referred to the various agencies sponsoring the need of the cripple and made suggestions which, with the vision of an extended experience were very helpful. The value of such auxilliary institutions as convalescent homes away from the hospital where the child's education might proceed both in the direction of physical and mental development, as well as contributory out-patient clinics in various towns in the district, were stressed.

At the conclusion of his speech he invited any interested physicians to accompany him on ward rounds where a number of cases were presented for him to express his views on the treatment of them. The memory of the skill of his demonstrations will long remain with the hearers.

JOHN WALLACE SCANE, M.D.

Obituary

JOHN WALLACE SCANE, M.D.

Few men in the Canadian profession were better known and more generally liked and respected than the late Dr. Scane. For more than twenty-five years on the teaching staff of the Faculty of Medicine of McGill University, during all that time an active and prominent member of the Canadian Medical Association, and for nearly a decade its permanent secretary, he exerted a powerful influence in favour of progress, good fellowship, and the unification of all the provincial associations into one active and strong body representing the profession as a whole.

Dr. Scane was born in Chatham, Ontario, in 1869. His father was a lawyer in high standing. His early education, which was thorough, was received in the public schools of his town. He began the study of medicine in the University of Toronto, but was shortly afterwards attracted to Montreal, and entered McGill in 1889, graduating from it in 1893. On graduation he was offered and accepted the position of house surgeon to the late Dr. James Bell in the Royal Victoria Hospital. This position he held for a year and a half, and on resigning it he commenced practice in the town of Westmount, where he remained about three years, when, owing to the ill-health of his wife, he removed to St. Thérèse, within easy motor ride of Montreal.

The subject of physiology was always a favourite study with him, and in 1896, in order to pursue his studies further, he applied for a demonstratorship in this department under the late Professor Mills, an appointment which he held for several years. In 1900 he went overseas and spent about a year in Germany, studying in its more important hospitals. In 1904, in addition to his work in the department of physiology he was appointed lecturer in pharmacology in full charge of all experimental demonstration work. In 1908 he was offered and accepted the position of lecturer in physiology in the University of Vermont, a position which he held concurrently with that in McGill, until 1913. In 1910 he was promoted to the assistant professorship in pharmacology. From this position he only resigned when Professor Barbour was placed in charge of the whole department. Two years ago the Faculty made him Assistant Dean, and placed him in charge of all the detail work connected with its activities. For many years he was also one of the representatives of the University on the board of the College of Physicians and Surgeons of the Province of Quebec.

As a companion and a *confrère* Dr. Scane enjoyed the confidence of all who knew him, possessing in a high degree the gift of friendship. He was everywhere recognized as a man of good judgment, with much breadth of mind, and kindliness of spirit. He was also an excellent musician. Fond of sports of all kinds, he excelled as a golfer and a curler. The following is an excerpt from the resolution passed by the Faculty of Medicine of McGill at their last meeting:

> "Dr. Scane has been intimately associated with this Faculty for the past twenty-five years, as a teacher, a medical registrar, and more recently as Assistant Dean. Indeed it may be said that his professional life from first to last has been mainly occupied in a direct service to his own university. Though his work in life has been far too short, it deserves to be measured in the highest terms, for it was ever distinguished by a genuine candour, a marked ability, and by sound judgment. In a conspicuous sense he was especially endowed and walked among us as a man admirably fitted for the position which he filled. From the beginning he exerted a far-reaching influence both by precept and example in the university life. Teacher and student alike regarded him with genuine affection, and to both he proved himself an ever present help in times of trouble. This academic career was widened and increased by his interest in medical education, and by his activities in the Canadian Medical Association, and in the College of Physicians and Surgeons of Quebec. And so his name came to be known throughout the medical world, and especially in Canada and the United States. To this same world his death now brings a signal loss."

He leaves behind, his widow, a son and two daughters. We are sure that his portrait which we present with this number will be received with pleasure by every member of the Association.

Lieutenant-Colonel William Malloch Hart M.C., died suddenly at Ottawa on April 17th, of peritonitis. The son of the late Professor Hart and Mrs. Hart, he was born in Winnipeg, and grew up there, graduating in Arts in 1902, and in Medicine in 1907. With the handicap of a fragile body, and later, of definite disease, he carried through cheerfully, the work of a strong man. His own illness directed him into large service to others who were ill. He was on the staff at Saranac, organized the Anti-Tuberculosis campaign in St. Louis County and the City of Duluth, and laid the foundations of Nopeming Sanatorium; organized the campaign in Saskatchewan, and laid the foundations of the Saskatchewan Sanatorium. This work he dropped at the very first shot of the War to enlist as a private in a machine-gun section. Later, as medical officer of the battalion in which he had served as private, he was in the front lines with his men in the confusion of the first gas attacks. Isolated with them, and refusing to leave them, and searching for means for their relief, he was taken prisoner. He was the first Canadian exchanged, and soon returned to the West front. Later, he organized the sanatorium and diagnostic centre for Canadians at Lenham, England, and commanded it to the close of the War, doing well a greatly needed work. On return to Canada, he was one of the five consultants to consider all phases of the condition of the tuberculous soldier, his treatment and re-establishment. The main report he had a large share in, and himself wrote the special report on after-care. He was retained at Ottawa as a permanent consultant and advisor with regard to the re-establishment of tuberculous soldiers. For this work he was eminently suited, having ample knowledge of conditions and the sympathy that comes from comradeship in arms. Methodical, persevering, untiring, judicial, fair, and above all, kind, he was just the man for the work. Here at his work, like the gallant soldier he was, death came upon him suddenly, and he passed from us scarcely yet forty-two. Above all else he was the kindliest of men, sympathetic, constant, untiring whenever he could help, patient, even under the tiresome recitals of sorrowful details that sometimes are inflicted upon friends. He was straight and fine in all his views of life, and did not know how to be anything but honourable. As we look back upon him, it is his smile we remember, which expressed the essence of the man, his kindliness, sympathy, tact, and sparkle of humour. At the same time he was strong in all his purposes. As a commander, he exacted the best service his men could give, with no abatement, but got gladly as a service of love. it

Dr. Neil McKendrick died on April 11th, at Placentia, Newfoundland, where he had practised for over forty years. He was one of the original members of the Newfoundland Medical Board and remained a member until two years ago when he resigned on account of ill health. Dr. McKendrick was born in the Province of

New Brunswick about seventy-one years ago, and was a graduate in Medicine of the University of Cincinnati, taking his degree in 1878. His remains were conveyed to St. John's for interment, his funeral being largely attended by prominent members of the medical profession of that city.

Dr. D. E. Mundell former professor of surgery at Queen's University Medical School, died in Kingston on June 11th. Dr. Mundell had been for many years in practice in Kingston and was one of the outstanding men of the medical profession in eastern Ontario. A graduate of Queen's in 1885, he became early associated with the faculty of medicine of his old university, and had been actively engaged in teaching surgery until two years ago. It is hoped that a more complete account of his many activities will be forthcoming in a subsequent issue of the Journal.

Dr. R. W. Bell a veteran of the Fenian Raid, in which he served with the 44th Brockville regiment, died on June 9th, in his 72nd year. A graduate of McGill in 1873, he had practised in Carleton Place and later in Peterborough. After twenty-five years spent as a medical practitioner, he came to Toronto in 1900, and was on the staff of the Toronto Hospital for the Insane.

Dr. May Austen, a graduate of Arts and Medicine of Dalhousie University, and for ten years a medical missionary for the Methodist Church of Canada assigned to the China mission field, died at her home, 352 Robie Street, Halifax, after a prolonged period of ill health, the break in health occurring while at duty in China.

Dr. A. J. DeVeau, of Meteghan, died from typhoid fever on the 9th of June, after four weeks' illness. Dr. DeVeau was a graduate of Dalhousie University, class of 1912. He was medical officer of health for the county of Clare, and was widely and favourably known in that community.

Dr. Charles E. Jarvis of London, Ontario, died suddenly on June 11th, in his 65th year. A graduate of Queen's University in 1882, he subsequently qualified as a homeopathist.

Dr. Daniel Hamilton died at Harriston on June 2nd, in his 86th year. He was one of the early settlers in the Harriston district, and had practised there for sixty years.

Dr. F. F. Bell died at Windsor on June 10th, in his 75th year.

Book Reviews

History of the Great War-Medical Services, Diseases of the War Volume II. Edited by Sir W. G. Macpherson, K.C.M.G., Colonel T. R. Elliott, C.B.E., D.S.O., F.R.S., and Lieut-Colonel Andrew Balfour, C.B., C.M.G. London: H.M. Stationery Office or through any bookseller, 1923. Medium, 8vo., pp. viii, 621; 7 coloured plates and other illustrations, 6 maps. Price, £1, 5s. net. Canadian Agents: The British Commonwealth Publishing Company, 61 College St., Toronto.

The first volume of the "Diseases of the War" was reviewed in the February number of the Journal. This second volume devotes about seventy pages to neurasthenia and war neuroses, fifty pages to skin diseases, forty pages to venereal disease and fifty pages to medical aspects of aviation and its diseases. The remainder of the volume, some three hundred and forty pages, deals with gas warfare, with a short chapter on medical problems in tanks and in mine warfare. It is an interesting statement that, in February, 1921, the total of men drawing pensions for neurasthenia and allied disabilities, was 65,000, a number not greatly below the total of casualties estimated as having been admitted to medical units during the war.

Though skin diseases are looked upon as minor maladies, their collective results show an enormous weakening of the man power of the army, particularly in conjunction with trench fever, which we now know is transmitted by body parasites. In one army in France, in the latter stages of the war, it is stated that the more common diseases were scabies, infections of the skin, and pyrexia of unknown origin, the latter made up principally of trench fever. These conditions accounted for ninety per cent. of all the sickness in this army. For the treatment of scabies, the most satisfactory procedure was found to be thorough rubbing with soft soap for fifteen minutes, then a warm bath for twenty minutes; during the last five minutes the infected sites to be gently scrubbed with a soft brush. After drying, sulphur ointment (B.P.) is to be rubbed over the whole body below the neck. This inunction is to be repeated on the second and third days, and on the fourth day, but not before, a second warm bath to be given, and then clean clothing and bedding supplied.

It is stated that the number of cases of venereal disease treated from August 4th, 1914, to the Armistice, numbered about 400,000, of which gonorrhoea formed sixty-six per cent. and syphilis twenty-four per cent. The rates for the whole British Army including Dominion forces, compared favourably with the rates for the three previous peace years, varying in the different war years from 37 to 52 per 1,000 per annum for all British troops, while during the peace years 1911-13, the rates were 51 to 60. The Canadian forces showed a higher rate while in Britain, reaching 222 per 1,000 in 1915, 209 in 1916, 114 in 1917 and dropping to 82 in 1918. The questions of prevention, personal prophylaxis ablution stations, abortive treatment and disposal of cases are fully discussed. Under treatment attention is given to the various measures adopted in different centres and an attempt is made to compare their relative efficacy. The experimental work on different arsenical preparations is recorded and there are three pages of general conclusions.

The chapters on gas warfare detail the principal attacks and these are illustrated by excellent maps. The gases used are classified under the headings, acute lung irritants, lachrymators, paralysants, sterutators and vesicants. When Germany threw discretion to the winds and adopted a method of warfare contrary to its pact at the Hague Convention and repugnant to the Nations who believed in observing a code of honour in warfare, they were in a position to secure enormous supplies through their great dye and chemical works. Britain in common with the French, had neglected the dye industry and had little or no experience in the commercial production of even the precursors of the organic poisons used. Phosgene was not manufactured in England before the war. By the end of 1915, England had produced 860 tons of gas and in 1917 alone, 18,500 tons. To the Germans is given credit for their skill in developing the offensive side of gas warfare, gaining a long lead in the design and production of gas shells, but the British held the leading place in defensive measures, the successive alterations in the British respirator keeping constantly ahead of the German offensive developments.

The symptoms, pathology and treatment of gas poisoning are fully presented and there is a bibliography appended to each chapter.

Pneumonia is one of the diseases which receives no mention except as a complication of influenza and tuberculosis is not mentioned in either volume. J. H. E.

Gonorrhoea—A Monograph On. By A. Reith Fraser, M.D., (Aberd.), Lecturer in venereal diseases, University of Cape Town, Major S.A.M.C., formerly Medical Inspector of Venereal Diseases, South Africa. Large octavo, pp. xvi + 508, 56 illustrations and 49 plates. 1923. London: Henry Kimpton. Price, 18s. net.

The author presents a complete treatise upon the subject of gonorrhoea and its complications. Gonorrhoea in the female (the upper limit of his field is the cervix) and in children, are treated as within the field of the venereologist. It is insisted that it is utterly impossible to sterilize the infected urethra by means of antiseptics now at our disposal, and a plea is made for conservative treatment and management of the infection as a systemic disease instead of as a localized specialized catarrh. The teaching is from personal clinical observation, with judicious use of the literature of the subject which may be classed as either accepted, speculative, controversial or experimental. The author is not enthusiastic about the value of the "ingenious 'scopes' for peering into the human vitals" which are now so popular, and questions the value to the untrained observer of the custom of reproducing "urethroscopic pictures of artistic colour and intriguing design."

The work is complete in detail and each chapter has in addition to a summary of its contents, an appended bibliography covering the matter presented. A valuable feature is a general index to these bibliographical references. There is as well an index to the names appearing in the text, and a copious general index. The chapter on the history of gonorrhoea is, perhaps, too concise, but is well written, and reference should be made to the chapter on the literature of gonorrhoea, which forms a splendid guide to the student. He gives a good summary of procedures, the value of which has not yet been generally accepted, such as complement fixation test. We have discovered numerous unimportant typographical errors in the text, but these do not detract from the value of the work, which may be looked upon as a masterly monograph. J. H. E.

Text-Book of Ophthalomology Fuchs, edited by Duane. Seventh American edition. Lippincott.

The average life-time of man does not measure the years that "Fuchs" has stood as a guide for students in Ophthalmology. Now comes the seventh edition in America, well measuring up to the high standard set by its predecessors.

Some changes in the arrangement of the subjects discussed have been made, and though these make for greater convenience in a search, the point of chief importance is that, in the re-writing of so much of the text, full cognizance has been taken of all the recent investigations in ophthalmology, so that one may depend upon finding discussed those advances, which are by experience proven trustworthy. Indeed, this new edition will hold its place as the outstanding authority in the specialty.

There is no division of the old book which has not been carefully gone over, and revisions made where the editor deemed necessary. Especially is this so in the chapter on motor anomalies, in which Duane is so personally interested. Also the chapter on the surgery of the eye-region, has been revised and enlarged, so that in every way the volume deserves its title.

The attempt to keep the text as much as possible as it was originally set down by Fuchs himself, is very creditable to the editor. Altogether, one can hardly conceive how a more satisfactory compilation of all that is dependable in this branch of medicine could be made.

The book-making is of the very best; paper and printing perfection, so that reading is easy. The addition of so much new material to the successive editions is making the volume a heavy one, so that we expect some day to see our old friend and guide appear in two volumes.

E. C. T.

The Heart in Modern Practice; Diagnosis and Treatment By William Duncan Reid, A.B., M.D., Chief of the Heart Clinic, Boston Dispensary. Large 8vo., pp. 352, 32 illustrations. 1923, Philadelphia and London, J. B. Lippincott Company. Price, $5.00.

The author's excuse for the appearance of this book is that he is aware of no single book in English which is suitable to recommend to the student or physician who asks for the name of a single volume which covers the subject of the heart in health and disease. The chapters on anatomy and physiology are sketchy, but serve as a review of the important considerations in these departments. Heart disease is treated from three view-points, etiological, structural and functional, rather than from the view alone of the pathology of the structures involved. About one-fifth of the main part of the book is taken up with case reports which appear as an appendix. The general make up of the book is not attractive. Thick paper, large type and wide spacing add unnecessarily to its bulk. J. H. E.

American Illustrated Medical Dictionary. (Dorland). A new and complete Dictionary of terms used in Medicine, Surgery, Dentistry, Pharmacy, Chemistry, Veterinary Science, Nursing, Biology, and kindred branches; with new and elaborate tables. Eleventh edition, revised and enlarged. Edited by W. A. Newman Dorland, M.D. Large octavo of 1229 pages, with 338 illustrations, 141 in colours. Philadelphia and London: W. B. Saunders Company, 1922. Flexible Leather, $7.75 net.; thumb index, $8.75 net. Canadian Agents: The J. F. Hartz Company, Limited, Toronto, Ont.

This is a reprint of the Eleventh Edition which appeared in 1921. The demand for this dictionary is indicated by the necessity for a new edition about every two years with numerous reprintings in the period since its first appearance in 1900. This edition is a revision of that of 1919, and is said to contain some 1,500 new terms, many of which have been added in the fields of biologic chemistry, endocrinology, immunology and neurology.

The typography is excellent for a work which contains so much in its 1,200 pages. Its scope is pronunciation, derivation and definition of the words and terms used in medicine and allied sciences. It includes eponyms, operations, signs and symptoms, as well as methods of treatment. A volume which has made such a place for itself in the physician's library needs no recommendation.

J. H. E

Green's Manual of Pathology and Morbid Anatomy. Bosanquet and Wilson. Thirteenth edition. Revised and enlarged, 1923. Published by Bailliere, Tindall & Cox, London, England. Quarto. 600 pages.

As stated in the preface, this text book has attained its jubilee, the original edition having appeared in 1871, at which time it constituted the first systematic introduction to the English student of the cellular pathology associated with the name Virchow. The book is well written, well illustrated, and contains in addition, several beautiful, coloured plates. Plates dealing with the blood and its disorders are particularly well done. Part I, on general pathology, contains excellent chapters on "nutrition," affections of which constitute so much of our pathology; "nutrition arrested" is necrosis, "nutrition impaired" is atrophy or it may be cloudy swelling or fatty degeneration, or further, mucoid, colloid or hyaline degeneration .Three chapters on parasites, metazoan, protozoan and vegetable are exceedingly well written and illustrated. The chapter on immunity is so written that it is easily appreciated, something difficult to say of most descriptions of this interesting subject.

Part II is given up to the diseases of special tissues and organs. One may note in passing that the old classification of diseases of the kidney is still retained, and that there is an exceptionally good chapter devoted to diseases of the nervous system.

Clearly printed on good paper and with every evidence of care in the process of its revision and editing, the book can safely be recommended as a text book for students or as a handy book of reference for the older practitioner. N. B. G.

Exercise in Education and Medicine. By R. Tait McKenzie, M.D., LL.D., Professor of Physical Education and Physical Therapy and Director of the Department of Physical Examination, University of Pennsylvania. Third Edition. Octavo of 601 pages, with 445 illustrations. 1922, Philadelphia and London: W. B. Saunders Company. Toronto: The J. F. Hartz Company, Limited. Price, $5.00.

The first edition of this work appeared in 1909, the second in 1915. This new edition includes the results of the author's experiences as Physical Training Officer and Inspector of Physical Therapy in the armies of Britain, Canada and the United States. He has made note also of the development of physical education in school programmes as a result of the revelation of physical debility and disability observed at mobilization and draft depots. The volume is divided into two parts, Exercise in Education, and Exercise in Medicine. Following a classification of exercises, several chapters are devoted to the physiological effects of exercise upon the muscles, lungs, heart and nutrition with particularly good chapters upon the estimation of heart efficiency and the effects of exercise on the heart. The various systems of exercise are outlined and their special applications evaluated. Physical education and competitive athletic sports both mass and individual, as carried out in camps, playgrounds, schools, and colleges are detailed in such a way as to make the work a guide to teachers and directors whether dealing with boys or girls. He has rendered special service in pointing out what can be done for mental and moral defectives, for the blind and for deaf mutes.

In the second part of the book he deals with the application of exercise to pathological conditions, devoting a chapter to massage and vibration, another to mechanical means for massage and muscular re-education. In the latter chapter are found several illustrations of the apparatus developed under the direction of Professor A. E. Bott in the Military School of Physio-Therapy at Hart House. There is much on the orthopaedic application of various exercises and apparatus for the correction of such conditions as flat foot, club foot, stooped and uneven shoulders and scoliosis. The more purely medical conditions such as visceroptosis, constipation, respiratory and circulatory diseases, obesity and exhaustion are treated in such a manner as to make the work one of great value to the general practitioner as well as to the physical director. The work should make a wide appeal to school boards, and all directorates of institutions devoted to education, to the care of the crippled and deformed both mental and physical. The illustrations in both parts of the work are excellent and add a most useful feature to a book of great merit. J. H. F

The Diagnosis and Treatment of Heart Disease: Practical Points for Students and Practitioners. By E. M. Brockbank, M.D., Vict., F.R.C.P. Cr. 8vo, pp. xi, 232, 22 figures and 3 plates. London: H. K. Lewis & Company, 1923. Price, 6s.6d. net.

Five editions in eleven years speaks well for the popularity of this small book on diagnosis and treatment. The fifth edition has rapidly followed the fourth. The author has made many changes and additions. The book though still small, contains some seventy added pages. A most useful chapter is that on practical points in the treatment of cardiac disease, where the general management of the case receives equal consideration with medicinal treatment. The added chapter on life insurance examination in relation to heart disease and altered function, should be helpful to the young practitioner with little experience in his work.

Not only is it an excellent book for students, covering succinctly as it does the general principles and practice of medicine in cardiac disease, but it should appeal to the general practitioner who will find many helpful suggestions. J. H. E.

Carriers in Infectious Diseases. By Henry J. Nichols, M.A., M.D., Major M.C., U.S. Army, Assistant Professor in the Army Medical School, Washington, D.C. With a section on Carriers in Veterinary Medicine, by R. A. Kelser, D.V.M., M.A., Captain, Veterinary Corps, U.S. Army. 184 pages. Baltimore: 1922, Williams & Wilkins Company. Price, $3.25.

The author makes an attempt to give a systematic discussion of the carrier problem as related to medicine and surgery. As Assistant Professor in Bacteriology, Parasitology and Preventive Medicine, he has had to approach these problems from both academic and practical viewpoints His army service has included the investigation of the origin of several epidemics where the carrier possibility had to be borne in mind, and during the war he had numerous opportunities to test the results of treatment of carriers both through clinical observation and by means of laboratory study.

The work is based upon his personal experience and a study of the literature available in the Surgeon-General's Library. The author refers to the text by Ledingham and Arkwright and that of Simon and points out that the present volume is intended to supplement them.

The author suggests the term phorology as a suitable designation for the science and art which deals with the carrier in relation to disease. He classifies the carrier into (a) incubationary—those who are infected, and infective individuals in the incubation period of a disease, and points out these are temporary carriers, (b) convalescent carriers—those convalescing from an infectious disease and who may be temporary, chronic, or relapsing carriers, and (c) contact carriers—healthy persons, those who acquire the parasite from association with carriers or patients without developing the disease themselves. These are immune persons. These may be temporary or chronic carriers and are classed as primary or secondary as they receive their parasite from a case or from a carrier.

The book is a manual rather than an exhaustive study. It is a practical guide for the physician, the health officer as well as the student. The references are principally to the American literature. Fifty pages are devoted to the animal carriers of those organisms pathogenic for both man and animals, including some forms possibly pathogenic for both and a group of organisms pathogenic for animals only. This is probably the first time a work has been written upon this subject. In this collected form it will prove of great practical value. J. H. E.

Handbook of Sanitary Law. By B. Burnett Ham, M.D., D.P.H. Ninth edition, pp. 244. London: H. K. Lewis & Co., Ltd., 1923.

This little book is intended mainly for the use of (English)—(reviewer's emendation) medical students desirous of taking the Diploma of Public Health.

Much of the subject-matter in the textbooks on hygiene and public health is scattered and difficult of access. An attempt has been made in this small manual to collect and condense under various headings the whole of the law bearing upon the public health as applicable to England and Wales. The London Act has also been added for the purposes of reference and comparison. In reducing the clauses of the Acts to a simpler and less complex form, every care has been taken to preserve the strict and definite legal meaning of the original statutory text."

The style and arrangement of this handbook seem admirable for its purpose—a condensation and correlation of the English laws, statutes, ordinances and regulations on every aspect of public health.

Excellent for the English student of English public health law, and for the Canadian student of comparative legislation, it is of little practical value to the Canadian student of Canadian law, since most of it is "not applicable" in this country, or requires that any applicability it has should be demonstrated by showing that Canadian laws, etc., are identical with those of England, in each given case. Since to accomplish this proof of applicability of English law involves discovery of what the Canadian law is first, and since, having ascertained the latter, the former is no longer of practical interest, it is difficult to see that this book can be of much value to D.P.H. students in this country except for occasional reference on points of academic interest. It is well printed and indexed. H. W. H.

Anaemia; Its Causes and Modern Treatment. With a chapter on Neurasthenia. By A. W. Fuller, M.D., Edin. Pages, 64. Cr. 8 vo. London: H. K. Lewis & pany Ltd., 1923. Price, 3.6d. net.

We can do nothing but condemn a book on anaemia, in which the author is so ignorant or so careless as to state that the leucocytes in normal blood number about 1,200 per cubic centimeter, and that the red cells in health number about 5,000,000 per cubic centimeter. Throughout the book he records the counts in cubic centimeters when it should read cubic millimeters.

That part of the book dealing with the causes of anemia is lamentably weak, while the treatment and results read like the literature of a charlatan or nostrum vendor. The whole object of the book appears to be to laud a certain injection. He states on page 32; "Colloidal forms of iron and manganese can be given by injection, but a combination of iron, arsenic and strychnine will be found to yield the best results. Many of these injections give a certain amount of pain, but the writer has found one that is absolutely painless. It consists of the last-mentioned medicaments in solution in isotonic serum. This can be given to a nervous patient without the least apprehension, and by adopting the auxiliary lines of treatment detailed above, a good result is invariably achieved," and there he leaves the reader. Apparently one can get this remarkable remedy only from the writer personally. From his statement that his treatment "should appeal to all, especially to business men" we are led to infer that the book is written for the laity rather than for the physician, advocating as it does a preparation of his own, the composition of which is not announced to the reader. This inference is strengthened by the word tachycardia being explained to the reader as rapid heart beat, the latter appearing in brackets following the former. J. H. E.

Notes on the History of Military Medicine. By Lieutenant-Colonel Fielding H. Garrison. Large octavo of 206 pages. Washington: Association of Military Surgeons, 1922. Paper: Price, $1.50.

This volume is a reprint of a series of articles which appeared in *The Military Surgeon* during 1921-22. Garrison's name bespeaks research and authority. With the resources of the Surgeon-General's Library at his command he has made an exhaustive study of the literature bearing upon his subject. The result is a comprehensive survey of military medicine from antiquity with bibliographical notes and references. For the first time there is made available for the student, or for the officer who wishes to write, lecture, or study, not a bare list of authorities, but a commentary on the literature, by which further research is made possible.

Following the chapters on Antiquity, Greece, Rome, and the Middle Ages, the Sixteenth and succeeding centuries are discussed in separate chapters. The chapter dealing with the Sixteenth Century opens with a quotation from President Lowell, of Harvard. "It is hardly an exaggeration to summarize the history of four hundred years by saying that the leading idea of a conquering nation in relation to the conquered was, in 1600, to change their religion; in 1700, to change their trade; in 1800, to change their laws, and, in 1900, to change their drainage."

Colonel Garrison has succeeded admirably in writing an outline of military medicine, which, though a valuable work of reference to the bibliographer, is as well an intensely interesting and readable story of the gradual development of medicine as applied to armies whether on peace footing or in the field. He points out that preparedness means preparedness to maintain peace as well as to make war, that with the awful possibilities of chemical, electrical and pathogenic agents in future wars the service of the Medical Department will be of even greater value. J. H. E.

International Clinics. Thirty-third series, volume I, 1923. Edited by Henry W. Cattell, A.M., M.D., Philadelphia, U.S.A., with Medical and Surgical Collaborators in United States, England and Canada. J. B. Lippincott Company, Montreal. Price, $2.50 per volume or $10.00 for the series of four.

We miss the familiar name of H. R. M. Landis on the editoral page, but the name of Henry W. Cattell is a promise that the high standards set by the retiring editor will be maintained. The departments appearing in this number are Medicine, with diagnosis and treatment, Paediatrics, Gynaecology and Obstetrics, and Surgery, with two border-land topics, The Medical Man in Politics, and on the Ethics of Pharmacy.

Neurology is well represented in several sections. Thayer's article on prognosis and treatment in angina pectoris has the place of prominence it well deserves, but there are many others of equal merit, such as the three succeeding papers on diseases of the digestive tract. Professor Dorland's practical hints from office experience in gynaecology may be read with profit by every general practitioner, and not the least valuable part of his paper is that dealing with birth control. The article on the management of a radiological clinic should offer helpful suggestions to hospitals installing such facilities.

The volume closes with a review of the advances in medicine and surgery during the past year to which is added abstracts of some of the more important surgical papers. J. H. E.

The Trial of Mary Queen of Scots. (1586). Edited by A. Francis Stewart. Octavo of 184 pages, 7 illustrations. Toronto: Canada Law Book Company, 1923.

This is a further volume of the "Notable British Trials" series. The introduction gives a short outline of the life of the unfortunate Queen. The procedure of the State trial is given in full, the first formal trial of a crowned sovereign in historic times. The legal processes which led up to Mary's imprisonment and trial are well detailed, as are the battles of the English lawyers and an account of her last days of misery borne with dignity and bravely. This volume has not the medico-legal interest of many of the series, but is none the less interesting as a history of the famous trial. J. H. E.

The Successful Physician. By Verlin C. Thomas, Visiting Physician of the Franklin Hospital, San Francisco. W. B. Saunders Company, 1923.

It is hardly fair that a work dealing with certain standards of the West should be judged by a conservative reviewer of the East. What to us for instance may seem an innovation, such as physicians' office buildings and certain modes of advertisement, is perhaps to the West the established mode of existence. The success of the physician in Dr. Thomas's book in any way save a material way is but lightly touched upon, it is admitted that you must know your work and must develop personality; sincerity, integrity, loyalty are described and are recognized as necessary for successful practice (perhaps some insistence on these points is necessary, there may be graduates in any school who have successfully evaded the forces of example) but it grates to read such sentiments as appear on page 27 concerning the choosing of one's friends, and to see paragraphs actually warning us that we should only choose as friends those who are likely to be of material use to us. The fine force of an ethical standard is seen in pages which deal with advertising, and the young physician is advised that it will not pay to advertise on the theatre programme because the actors' union are likely to have their own doctor. The suggestion that one should deliberately cultivate the acquaintance of Pullman car conductors, porters and hotel clerks, purely with the idea of having them refer patients to one would certainly interest this class of humanity if they could know that we looked on them merely as touts for our business. To the reviewer it seemed a sad thing that work of this sort be considered in any way necessary, but perhaps his ideas or ideals have not kept pace with the times. From the references, quotations and authorities one gathers quickly that the efficiency experts have had a large influence in the thought which has produced this work and if medical practice is to be considered as purely a matter of business the Successful Physician may well be in the hands of men who feel that way; to copy a well known criticism, "those that like that sort of a thing will like this sort of a book."

N. B. G.

Rest and Other Things, a Little Book of Plain Talks on Tuberculosis Problems. By Allen K. Krause, A., M. M.D., Associate Professor in Medicine and Director Dows Tuberculosis Research Fund, Johns Hopkins University. Small 8vo, 159 pages. Baltimore: 1923. Williams and Wilkins Company. Price, $1.50.

This little volume of eight essays and addresses is made up from six which have appeared in *The American Review of Tuberculosis*, and two others from the *Journal of the Outdoor Life* and the *New York State Journal of Medicine*. Krause needs no introduction to the medical profession. As an Assistant Professor in Johns Hopkins University, as director of a tuberculosis research laboratory, as an editor, essayist and speaker he is well known. We have prized these essays since their appearance as reprints. They should have been made available in book form earlier. We welcome them now for their great value to the practitioner, the teacher and the tuberculosis worker. The essays are plain talks full of concentrated wisdom. Two deal with the rationale of rest, and these should be read by everyone who has to deal with a patient under treatment. Two on childhood infection and its relation to adult pulmonary tuberculosis make clear our present conception of the entrance and spread of tuberculosis, the steps which may lead from infection to the clinical manifestations of disease. Two on the tuberculosis problem and the method of attack are followed by a discussion of the problem of medical education in tuberculosis.

With the companion volume, uniform in size and price, *Environment and Resistance in Tuberculosis* we have a good summary of the belief of this great teacher and investigator. Careful reading of these two volumes by the audience to which they are addressed will go far to clarify our conception of tuberculosis as an infection, as a disease and as a public health problem, and will go far to aid the reader in his work of healing the sick, of prevention of disease and of aiding in lessening the incidence of tuberculosis.

J. H. E.

The Chemistry of Tuberculosis. By H. Gideon Wells, M.D., Ph.D., Professor of Pathology, Lydia M. DeWitt, M.D., A.M., Associate Professor of Pathology, and Esmond R. Long, Ph.D., Assistant Professor of Pathology, University of Chicago and Rush Medical College. Cloth, 438 pages, 6 x 9. Baltimore: Williams & Wilkins Company, 1922. Price, $5.25 post paid.

This book is stated to be a compilation and critical review of existing knowledge on three subjects (1) the chemistry of the tubercle bacillus and its products, (2) the chemical changes and processes in the host, and (3) the chemical aspects of the treatment of tuberculosis. For some twelve years the Otho S. A. Sprague Memorial Institute, of which Dr. Wells is director, has been carrying on research work in the chemotherapy of tuberculosis. The collecting and reviewing of the literature on the subject for their own use made this volume possible. Students of tuberculosis whether clinical or laboratory owe a debt of gratitude to the authors for making the subject matter of this monograph available. So thorough has been the work that the authors believe it will be possible to find in this book whatever has so far been learned concerning any chemical problem which may come up for consideration. It is their intention to keep the subject matter up to date in new editions if called for.

Considerable space is devoted to the chemistry of the tubercle bacillus itself, its waxy envelope and to tuberculin, including the metabolism of the bacillus and a discussion of its acid-fastness. Other acid-fast bacilli are also considered.

Under the heading of chemical changes in the host there is much relating to necrosis, caseation and the substances found in tuberculous tissues including analysis of calcified deposits, lung stones and pneumonokoniosis. The chemistry of the blood, of effusions and of the sputum is well treated, while metabolism requires nearly fifty pages for its presentation.

Both the clinician and the laboratory worker will be interested in the third section of the book which treats of chemotherapy. It is pointed out that the anatomical changes of tuberculosis have been long and carefully studied from a morphological standpoint, yet such changes are associated with chemical changes in the tissues, blood lymph and body fluids in the excretions and the secretions including those of the ductless glands.

There is a rather detailed account of the experimental work which has been done in an effort to develop a specific chemotherapy. Chemotherapy is defined in a general sense as the treatment of a disease by the use of any drug or chemical. Dye therapy, creosote, guaiacol, cinnamic acid, cod-liver oil and other fats and fatty acids among the organic substances, arsenic, copper, gold, mercury and iodine among the inorganic substances, are well reviewed. Calcium therapy also receives due notice.

The references to the literature appear conveniently as foot notes.

J. H. E.

Pathological Histology. By Gustave Roussy and Ivan Bertrand. Translated from the second French edition by Joseph McFarland, M.D., Sc.D., Professor of Pathology and Bacteriology, University of Pennsylvania. Lea & Febiger, Philadelphia and New York, 1922.

From its artistic, embossed leather binding to the last letter of the index, this small work of 270 pages does credit to its authors, translators and publishers. In the short preface of the translator it is stated that the book is novel in almost every particular, and has no parallel among the books offered to students of medicine. While not professing to take up all histology, it is yet a guide to the microscopical study of morbid tissues, 124 excellent plates are given, (all placed on the right hand pages): short descriptions, the normal histology of every organ are given (in some cases with plates) and the pathology is then considered under the terms of diagnosis of the organs and diagnosis of the lesion.

The book seems particularly well arranged for the student. A short introduction on the microscope, the elementary principles of technique, and the short descriptions with the engravings seem excellently suited to the purpose of teaching the beginner the ground plan of pathological histology.

N. B. G.

How We Resist Disease. By Jean Broadhurst, Ph.D. Illustrated with 138 engravings and 4 colour plates. Published by J. B. Lippincott Company, Philadelphia and London, 1923.

This is a small book of 212 pages, well printed and profusely illustrated, written with a view to satisfy the needs of general college students and nurses who have but a limited time to devote to the study of immunity. The author in a simple and interesting way has well presented the outstanding and important portions of the subject of immunity. The first chapter of forty-three pages is devoted to a summary of the main effects of bacterial action on tissues. The author pre-supposes that the student has an elementary knowledge of bac-

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teria and does not allot any space to bacterial study. The remaining chapters deal in turn with a concise, but to the point, discussion of active and passive immunity, toxins and antitoxins, agglutinins and precipitins, opsonins and phagocytosis, lysins and complement fixation tests, vaccines, and finally anaphylaxis. Each of these chapters have been carefully compiled and present to the reader in a very understandable and interesting form the salient features of the subject under discussion. A glossary of terms used in immunological study is appended.

As the author has intended, the book will be of much value to students who in their course require a superficial knowledge of immunology; to the nurse in training, however, as their course in most institutions is given at the present time, this book is too comprehensive as a text but would serve admirably as a nurses' reference book in immunology. To the busy general practitioner who desires a small volume which quickly places before him a clean cut picture of the problems of immunity, this small handbook can be well recommended. F. W. LUNEY

Books Received

Transactions of the American Surgical Association—40th volume. Edited by John H. Jopson, M.D. For sale by William J. Dornan, Philadelphia.

Standard Methods for the Examination of Water and Sewage—fifth edition. Published by American Public Health Association, New York City, 1923.

Standard Methods of Milk Analysis—of the American Public Health Association and the Association of Official Agricultural Chemists. Fourth edition. Price, 40 cents. Published by the American Public Health Association, New York City, 1923.

Applied Psychology for Nurses By Donald A. Laird. 229 pages, illustrated. Price, $2.50. Published by J. B. Lippincott Company, 201 Unity Building, Montreal, 1923.

Outline of Ultra-Violet Therapy Second edition. By A. J. Pacini, M.D. 204 pages, illustrated. Published by Poole Bros., Chicago, 1923.

Cyanosis Volume II. By Christen Lundsgaard and Donald D. VanSlyke. 71 pages, illustrated. Published by Williams & Wilkins Company, Baltimore, Maryland, U.S.A., 1923. Price, $2.00.

Legal Medicane and Toxicology Volumes I and II. By Frederick Peterson, M.D., Walter S. Haines, M.D., and Ralph W. Webster, M.D. Two octavo volumes, totalling 2,268 pages, with 334 illustrations, including 10 insets in colours. Price, cloth, $20.00 net. Published by W. B. Saunders Company, Philadelphia and London. Canadian Agents—The J. F. Hartz Co., Ltd.

The Electrocoagulation Method of Treating Diseased Tonsils.—Frank J. Novak, Jr., Chicago, employed this method in 100 cases. Without exception, the patients had a stormy experience beginning a few hours after operation. Pain was uncontrollable save by liberal doses of morphin. There was extreme difficulty in swallowing, much greater than after tonsillectomy. The plate was extremely edematous, and speech was impossible. The intensity of this reaction persisted through the sixth day. Whatever logical basis electrocoagulation of diseased tonsils may have, from a theoretical standpoint, is far outshadowed by the unsatisfactory results in actual practice. Novak believes that the method is entirely inadequate, inaccurate and unsatisfactory, and cannot in any manner compete with the accepted present-day methods of tonsillectomy.—*Journal A. M. A.*, June 23, 1923.

VARICOSE VEINS

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THE SEPTIC FACTOR IN THE THREE GREAT PLAGUES*

William J. Mayo

Rochester, Minn.

A GRATEFUL world has recently celebrated the hundredth anniversary of the birth of Pasteur, whose contributions to the welfare of the human race were greater than those of any other man.

It is difficult to visualize the form, activities, and death-dealing properties of the microscopic organisms which Pasteur proved are responsible for the greater number of the diseases afflicting man and animal. While our knowledge of micro-organisms is by no means complete, scientific investigations have been fruitful and, largely because of this, the average duration of life has been greatly prolonged in the last four decades.

As a medical student I listened to an address by a lecturer who picturesquely described bacteria as of three varieties. First, the obligate parasites, which live only on the living. The bacillus of tuberculosis is a common example of this variety and, as was pointed out, does not always destroy the host, since by so doing the invading species itself would be destroyed. Second, the saphrophytes, which exist only on dead tissues, and are responsible for putrefactive and fermentative changes. The secondary effect, however, of the saphrophytes is to produce chemical and toxic poisons which break down the resistance of the living animal organism to other forms of bacteria, as in necrotic processes. Third, facultative bacteria, which are able to live either on the living, like the obligate parasites, or to live as saprophytes. While time has not confirmed in all respects the details of this graphic presentation of the subject, the vision of the orator arouses imagination.

Slowly the older races of Asia have acquired pathological resistance to obligate organisms and to saprophytes. Tuberculosis is relatively less common and less serious among the inhabitants of the Orient than among those of the Occident, although the conditions favourable to tuberculosis are much more prevalent in the former countries. The inhabitant of the Orient has much greater resistance to saprophytes than the inhabitants of the Occident; the former maintains a fair degree of health in the face of unhygienic conditions under which the latter succumbs. But, on the other hand, the great world plagues, such as the bubonic plague and cholera, possibly because of a dual life-sustaining property of the specific organisms, constantly exist in some form among the inhabitants of the Orient because of their condition of life.

At the other extreme the American Indian offers an example. He was originally spontaneously nomadic, because moving from place to place at short intervals carried him away from his own filth; now that he is housed continuously he has little resistance to micro-organisms which cause disease, and has fallen ready prey to them. In the animal kingdom bodily excretions are poisonous to the producer, contrary to the condition of life in the vegetable kingdom under which its excreta act as a fertilizer to the producer. Prohibition became possible in the United States when a supply of pure drinking water was at hand. The drinking of wine and beer will continue in France, Italy and Germany until pure water can be obtained for general consumption. In the first ten years following the introduction into Vienna of a pure water supply from the mountains, the *per capita* consumption of alcoholic and fermented drinks was reduced spontaneously forty per cent.

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*Read before the Canadian Medical Association, Montreal, June, 1923.

Vaughan believes that bacteria are not vegetable, but an independent group lying between the animal and vegetable organisms. The conviction that bacteria are more resistant than animal organisms to specific poisons which might select the bacteria without harm to the animal cell is undoubtedly true, although recent experiments in chemotherapy have shown that there are certain poisons which will select the parasite rather than the host. For instance, derivatives of quinine have destroyed the pneumococcus in animal experimentation, and again experiments have shown the efficacy of gentian violet and other dyes in the local sterilization of infected tissues and surfaces. Browning and his co-workers recently have shown that acid fuchsin selectively affects bacteria which do not stain by the Gram method.

The spirochaeta are closely related to bacteria, but because they can be poisoned specifically by arsenic derivatives, such as arsphenamin, and by mercury, without harm to the animal organism, illustrated conspicuously in the *Spirochaeta pallida*, they have been classified with the protozoa. Perhaps they should be placed in a separate group between the bacteria and the protozoa.

For the animal parasites, great and small, specific poisons have been found; quinine for the plasmodium of malaria, emetin for the amoeba of dysentery, thymol for hookworm, and male fern for tapeworm. It is a far cry to designate the carcinoma cell as an example of the protozoa. Few who are entitled to an opinion believe that carcinoma is caused by the invasion of an external and specific organism, bacterial or protozoal, although it is recognized that the disturbance which results in the invasion of the carcinoma cell rises in the protective coverings of the body, and that irritation from any cause in this protective mechanism may open up atria through which external agents may obtain a foothold. When the malignant process is once set in motion, the abnormal, immature protective cell itself becomes the specific destructive agent. Perhaps the ability of the tissues to develop normal mature protective cells in response to chronic irritation, bacterial, chemical and so forth, has been gradually overtaxed until finally undifferentiated embryonic cells are stimulated beyond the point of control. The carcinoma cell, regardless of causation, however, becomes as specific an agent of infection to the afflicted individual as any form of microbic organism and reproduces in each new locality of invasion the morphology of its origin. The embryonic carcinoma cell is five times as vulnerable as the normal mature cell to heat or irradiation. When the cure for carcinoma comes, as come it will, it may be through the introduction of some substance which will act specifically on the lower vitality of the embryonic cell.

The three great plagues of mankind are tuberculosis, syphilis, and carcinoma, manifestations of the bacterium, spirochete and the parasitic cancer cell. Of the many features these three infections have in common the most important is their relation to the lymphatics. Cohnheim pointed out, many years ago, that if one could find the original "sentinel" gland, that is, the one first involved, the point of origin of the disease through the defensive mechanism of the body could be ascertained. We are just beginning to realize the close relation of biophysics to the physiological processes of the body. It has been shown by Herring and MacNaughton that the lymphatics are a closed system of absorbents, their function being to pick up material insoluble in water and too large to enter the capillaries. Krogh and others have demonstrated that the blood capillaries are concerned with material of molecular size, such as oxygen, crystalloids and amino acids, soluble in water, and that even material of colloid size will not pass in or out of the walls of the capillaries, except those of the portal system. Bacteria are too large to pass through the capillary interspaces and are, therefore, picked up by the endothelial cells which become phagocytic and by diapedesis enter the lymphatics where an attempt is made to destroy or sterilize the organisms. The resistance developed by the lymphatics varies in different persons and with different forms of infection. The process is accompanied by increased vascularization, phagocytosis, and the development of connective tissue which contracts until it destroys or interferes with the nutrition of the contained organisms. The latent phase of these contained organisms, the bacilli of tuberculosis, spirochetes, and the carcinoma cell, may be prolonged, resulting in renewed activity after many years, due to ultimate breaking down of the lymphatic barriers from injury or intercurrent disease.

The reactions of the great infections, one on another, when in combination, which occurs not infrequently, are disastrous, especially if sepsis co-exists. Patients with tuberculosis seldom die from the disease itself, except in the presence of meningitis, when the inflammatory products of the specific infection are under pressure; the greater number die from the associated sepsis. Patients with syphilis may die from terminal tuberculosis. The buccal leukoplakia of syphilitic origin leads to chronic septic irritation in which carcinoma may develop. Sepsis is a common and unfortunate secondary infection of syphilis, tuberculosis, and carcinoma, causing great distress to the patient and shortening of life. Sepsis is also a factor in the visibility of the manifestations of tuberculosis, syphilis, and carcinoma. Persons of cleanly habits may have little or none of the hardness in the base of the chancre which is due to sepsis, and the manifestations of syphilis in the clean may be extremely mild. According to Corner, the unclean are more likely to have prominent display of primary and secondary syphilitic lesions with consequent early diagnosis, and the advantages of early treatment. In carcinoma of the internal organs the disease may progress with little or no pain because of the absence of sepsis, in marked contrast with the open septic conditions of external carcinoma, which explains the common conception of the laity that death from carcinoma means being eaten alive. While sepsis is due to a secondary invader it is of the greatest importance in a study of these plagues.

The question of immunity to the three great infections has stimulated interesting speculation, but as yet exemption has not been proved. In the sense of the actual causative agents of these plagues passing from mother to child, the spirochete only is known to pass through the placenta, but it would appear that certain persons have inherited or acquired more than average resistance to the causes of tuberculosis, syphilis, and carcinoma, or in some way present unfavourable conditions to the harbouring or growth of these infections.

Tuberculosis

The septic factor in tuberculosis is the most important factor. Tuberculosis itself seldom kills unless the products of the tuberculous infection are confined in a bony box and produce injurious pressure, as in the brain. Other parts of the body, the thorax, peritoneal cavity, and the soft parts generally, yield to pressure; this gives time for development of local resistance and generalized immunity. The greater number of patients with tuberculosis die from intercurrent disease in which sepsis plays the chief rôle. The ancients recognized that opening a so-called cold abscess would be followed by hectic, picket-fence temperature, prolonged discharge, and eventually by death. They recognized nature's ability to open spontaneously such an abscess without the development of these symptoms, although they failed, as we fail now, to imitate the same mechanism for safe drainage. Too often physicians introduce probes into spontaneous sinuses following cold abscess and cause deep infection and everlasting damage. So important is the septic factor in tuberculosis that the main consideration in any operation for the disease is to avoid mixed infection. In certain situations tuberculosis may be a mixed infection from the start, as occurs in the intestine. The most common type is that due to swallowed sputum which causes multiple ulcerous lesions which, in time, often result in intercommunicating fistulas involving the small and large intestines, but occasionally the ulcerous tuberculous process may be limited to a small intestinal area, and partial healing with obstruction takes place. Such patients are cured of the local lesion by resection and the improvement in their general condition is very great; the septic factor may be the deciding one in the eventual result.

In contradistinction to the ulcerating type of intestinal tuberculosis is the so-called hyperplastic tuberculosis, usually the result of bovine tuberculosis bacilli, which as a rule involves the ileocecal coil, especially the caecum and ascending colon, although it is seen occasionally in other parts of the large intestine and even in the small bowel. In this localized and most curable form, a tumour develops which so closely resembles malignant disease that the surgeon on resecting it cannot always rule out carcinoma until microscopic examination has been made. The severe anaemia in these cases, as in malignant disease of the head of the colon, is out of proportion to the extent of disease, and may lead the inexperienced observer to regard the condition as incurable.

Tuberculosis of the peritoneum is an interesting surgical condition. The ascitic forms are most common in women, usually originating in tuberculosis of the mucous membrane of the Fallopian tubes which like the bronchi are lined with ciliated epithelium. The tuberculous peritonitis is the result of the escape of tuberculous material through the open fimbriated extremity of the tube into the peritoneal cavity, and the peritonitis is a conservative process of nature in an attempt to destroy the infecting material. The Fallopian tube in tuberculosis is usually open, in contrast to the closed tube in gonorrhoea. The reasons for failure to cure tuberculosis of the peritoneum in the majority of cases by merely emptying the fluid can readily be seen. If the abdomen is opened the results are better, although still unsatisfactory, because the fluid is removed more thoroughly, not because sunlight and air are admitted into the peritoneal cavity. Complete removal of the fluid in many cases permits the fimbriated end of the Fallopian tube to become adherent to the sigmoid or neighbouring peritoneum, so that the products are retained within the tube. The ascites disappears as the necessity for a peritoneal defense passes away, but the products accumulate in the tube and become manifest on pelvic examination. Removal of these tubes can be effected readily by enucleation, often without a ligature, with cure of the disease in a high percentage of cases. It is not necessary to remove the ovaries as they have only a surface infection, similar to that of the intestine. The cause of tuberculous infection of the peritoneum, especially in children, is sometimes to be found in infected lymph-nodes. The so-called adhesive type of peritonitis, more common in the male, is a very favourable form. The abdomen becomes hard, fibrous exudate forms, and spontaneous recovery usually takes place. Operation should not be performed, since it merely opens up adherent spaces in the peritoneal cavity and sometimes leads to intestinal injury and faecal fistula. This type argues for a mixed infection from a septic source, usually the intestine, and sepsis causes the plastic peritonitis. Because the complicating septic bacteria which produce the plastic exudate are short-lived, the exudate may be found sterile. I have had a few cases in which early operation for the evacuation of localized pockets of septic material revealed short-lived types of pus-forming organisms which later would have disappeared through natural defense.

Syphilis

Hale White, in his statistical table of the death-rate in cases of syphilis following two years of treatment, showed it to be nearly twice the normal in various periods after the first five years. The usual estimate of the incidence of syphilis in European cities is from twelve to fourteen per cent. of the adult population.

The effect of sepsis on syphilis is most disastrous. Stokes confirms the observation of Duke as to the extraordinary improvement in cases of stubborn viscero-syphilis and neurosyphilis, which may sometimes be secured by removal of all sources of focal septic infection. Stokes emphasizes the fact that the combined effect of inflammatory and degenerative changes may cause the diagnostician to overestimate the permanent damage, which can be seen only after the inflammatory complication subsides.

Recent knowledge of syphilis has unsettled, more or less, the opinions of the past generations which were based chiefly on clinical observation. It is probable that the present-day note of uncertainty is due in a great degree to the results of experimental research, largely on rabbits, and the occasional failure to arrest advanced syphilis, especially of the nervous system. Patients who early show external manifestations of syphilis in the shape of well-marked secondaries in the skin, mucous membrane, bones, and soft parts present a more curable form, or at least are less liable to syphilitic attack on the nervous system, even as a late manifestation; perhaps because the disease in the visible parts of the body leads to earlier diagnosis and treatment. It is possible, or even probable that there is a certain specificity in strains of spirochetes which causes attack on the nervous system in one case and in another affects the external portions of the body. The work of Rosenow on specificity of bacteria leads us to believe that this is true. On the other hand, in the location and progress of syphilis the individual soil may vary and the spirochetes be the same. Negroes seldom develop syphilis of the nervous system, but suffer to a far greater extent than the white race from its vascular manifestations in the heart, aortic aneurism, and so forth. When the nervous system of the negro is involved, the condition is usually due to the paralytic effects of cerebral thromboses, rupture of miliary aneurisms, and secondary embolisms, rather than to primary neuro-syphilis.

Our sheet anchor of diagnosis has been the more or less fallible blood Wassermann reaction. The blood Wassermann reaction in the secondary stage of syphilis is manifest in nearly 100 per cent. of cases; in late syphilis of the viscera, bones, skin, and so forth, in more than eighty per cent., and in syphilis of the nervous system in about fifty per cent. Spinal puncture in such cases gives a higher average of successes than the blood Wassermann test. The nervous system has no lymphatics and the nerve cells are insulated by the neuroglia, so that the spirochete may remain latent here indefinitely, defying diagnosis, and protected against remedies.

It is probable that there are in the body certain other tissues in which the spirochetes may remain latent indefinitely without manifestations, such as the heart in congenital syphilis, and the testes, spleen, and lymph-nodes in acquired syphilis. The enlarged lymph-nodes may restrain the advance of the spirochetes, and encapsulate them so as to prevent indefinitely evidence of their presence. Incidentally, the lymph-nodes may protect the spirochetes against medication, permitting reinfection of the patient from time to time, as would any other form of focal infection, quite parallel to the glandular manifestations of tuberculosis and carcinoma. In certain cases of intractable syphilis with splenomegalia, in which anaemia is a prominent symptom, prolonged treatment sometimes fails to arrest the disease. Its progress is quickly arrested and the anaemia promptly overcome by removal of the greatly enlarged spleen in which spirochetes will be found.

It may be possible that a similar condition exists in the deeper layers of the skin, where general medication for syphilis occasionally fails to arrest the disease. In such cases disappearance of the visible manifestations sometimes follows the inunction of mercury which possibly acts more directly on the disease than do other forms of treatment.

The arsenic compounds are of great value, not only as curative agents, but also as public health agents, within six hours rendering carriers of the disease in a contagious form, such as those who show chancres and mucous patches, temporarily incapable of infecting others.

Stokes says, "Early syphilis can be arrested in a high percentage of cases, and the majority of patients if well treated can be said to be cured. Late syphilis, outside the nervous system, can be arrested in the great majority of cases. Neurosyphilis can be arrested perhaps in from fifty to sixty per cent. of cases, and the condition of the patient greatly improved in from eighty to eighty-five per cent."

It is wise to use arsphenamin as soon as possible in known syphilis, but there has been a wide and unfortunate tendency to use it in doubtful cases of early syphilis. The position of the patient with doubtful early syphilis who has had arsphenamin used is most unfortunate, for he must carry the onus of suspected syphilis without knowing whether he ever really had it. Until it can be definitely shown that early use of arsphenamin will cure the patient, it is unfair to subject him to a lifetime of apprehension by too lightly administering a treatment which may delay the eventual manifestations of the disease, but will fail to cure him permanently. Again, prolonged treatment of patients with doubtful syphilis, or rather patients with doubtful Wassermann reactions, who have an associated urgent surgical condition, such as carcinoma, leads to delay and loss of precious time if the patient is to be cured. Stokes follows the plan, in such cases, of giving arsphenamin treatment immediately, which does not delay necessary operation but permits early exploration in cases in which the diagnosis of syphilis or malignant disease is doubtful. When the incision is made the surgeon immediately removes a piece of involved tissue, which in frozen section may be identified within two or three minutes as malignant or non-malignant. If it proves to be malignant, a radical operation can be carried out at once.

Carcinoma

Glandular involvement in carcinoma tells the story. While operative skill and technique are important, generally speaking, results show that without regard to the type of operation, five-year cures occur in seventy-one per cent. of cases in which operation was performed for carcinoma before the glands were involved, and in only nineteen per cent. after they were involved. Local operations cure local disease; massive operations fail when the local stage has passed. While low operative mortality in carcinoma is important, extension of operability is also very important because it gives a larger number of patients a chance for cure. For cancer of the gastro-intestinal tract, which means, practically, the stomach, large intestine, and rectum, a ten per cent. mortality following operation is a fair risk and justifies the procedure. When I find mortality better than ten per cent. I extend the operability, taking more advanced cases, and as a result have had some unexpected cures. Enlarged glands may be due to associated sepsis and not to carcinoma, and incorrect diagnosis may lead to failure to remove a curable growth. Methods of handling these cases, such as the two-stage operation of Mikulicz for carcinoma of the sigmoid, and preliminary colostomies for carcinoma of the rectum, lessen the septic factor and are of the greatest value in extending operability and reducing mortality.

The associated sepsis in cancer is the cause of much of the distress and hurries the patient to a fatal end. In the Middlesex Cancer Hospital, London, by establishing strict asepsis and antisepsis, cachexia, which is a combination of anaemia and sepsis, has been greatly lessened. The patients are made more comfortable and their lives prolonged. We all recognize the dangers of operating on the infected, so-called inflammatory, carcinomas, such as those around the mouth and the cervix. The use of the knife in these cases is often followed by rapid recurrence and metastasis from infected venous thrombi. Cautery excision in these cases, followed later by plastic repair, is a step in the right direction. The cautery procedure should not be abandoned, particularly in infected carcinomatous processes around the mouth and jaws. In many cases of infected carcinoma, radium and the X-ray are now used, and they have a similar effect without the risks of the tissue destruction and sloughing which accompanied the use of the cautery. Experience with irradiation has demonstrated a number of things. First, that if there is actual loss of tissue by the involvement in carcinoma, although the disease may be eradicated by irradiation, the tissues are not restored. Radium is destructive and may be more so than operation. In the alimentary tract, huge fibrous strictures follow the use of radium, and secondary operation for the relief of these strictures is seldom as successful as if the patient had been operated on primarily. It should be remembered, too, that the handling of radium, especially in malignant disease, requires an expert. There are many men who, with a small amount of radium, do little good and an enormous amount of harm. With good faith, but poor judgment, they apply radium in cases in which operation should have been performed early, causing delay and perhaps failure in a subsequent operation which, primarily would have been successful. In operating on patients subsequent to the use of radium the operative mortality is greatly increased and prospects of permanent cure are greatly reduced. Generally speaking, the use of radium means the parting of the ways. If radium is selected, one can seldom turn back and take the operative route with a good prospect of success. In certain situations of the body where the tissues can be easily removed this does not hold true, and in special cases the preliminary use of radium to be followed by operation, as soon as the inflammatory condition from the radium subsides, may be advisable. However, the physician with little experience who, without surgical consultation, uses radium on the operable patient, is not giving him a fair chance. The use of radium or the X-ray following operation has much to commend it in certain types of cases. The more cellular the growth, the less the prospect of benefit from surgical operation, and the greater the prospect of benefit from radium and Roentgen rays. In the hands of the expert, these agents have an enormous field of usefulness. In cases of inoperable carcinoma of the cervix in which the vaginal wall is involved and the uterus fixed, radium often causes the disease to disappear painlessly; some of our patients have remained well for years. Radium not only destroys the carcinoma cell and sterilizes nuclei at a greater distance, but it also reduces the sepsis. Because the ill-advised use of radium has done harm, let us not deny its extraordinary power for good when properly employed. Desjardins has demonstrated that irradiation by modern Roentgen-ray methods in the hands of the expert is of great value and promises much in the immediate future.

A Personal Experience with Sprue.—S. M. Lambert, New York, describes his experience with sprue, emphasizing especially the value of the hydrochloric acid-pancreatin treatment first advocated by T. R. Brown in 1916. Lambert took 15 minims (1 c.c.) of 0.2 per cent. hydrochloric acid before, and 10 grains of pancreatin after, each meal without dietary precaution. This treatment has spread into general use along the Queensland coast, and was found quite satisfactory in the treatment of many early cases. Lambert thinks it merits more general attention than it has attracted.—*Journal A. M.A.* June 30th, 1923.

PRESIDENT'S ADDRESS*

E. R. Secord, M.D., C.M.

Brantford

IT is my first, and one of my most pleasant duties to welcome you on behalf of the Ontario Medical Association to our forty-third annual meeting, to-day opened in this historic and at the same time progressive city of Windsor.

At the termination of a presidential year, one's thoughts naturally run in two directions—the one retrospective and the other anticipatory. In reviewing the events of the last twelve months one finds some matters for congratulation, and still others which have not developed in an entirely satisfactory manner.

Perhaps the occurrence which has been the most satisfactory, and at the same time the most concrete example of the beneficent results of organization was the passage at the last session of the Legislature of the *Medical Act of 1923*, which in three brief clauses gives us a comprehensive and satisfactory definition of the practise of medicine, puts a stop to any further invasion by irregulars, and places the responsibility for prosecution of infringements of the Act on the shoulders of the county crown attorney rather than on those of the medical profession. I believe that the passage of this Act is the most important forward step in the history of medicine in this province, which has been taken in many years, a step at once protective to the qualified medical practitioner, and to every sick person in the community as well.

Two things are here well worthy of mention. Firstly the illustration of what an organized and united medical profession can accomplish. The Act was introduced in the Legislature by Premier Drury on Friday, April the 27th. It was referred to by the Saturday morning papers, and by Saturday afternoon strong chiropractic opposition had developed, an opposition, which, as subsequently appeared, was not wanting in powerful financial backing. Sunday morning found our Central Office in telephonic communication with each of our constituent county societies asking for support for the Bill, and by Monday morning, or within twenty-four hours, the legislators at Queen's Park were deluged with approximately five thousand telegrams from every corner of the province asking for, yes, even demanding, favourable action. Partly, at least, as a result of this pressure the Bill was enacted without any important modification.

Secondly, that while many years of difficult, trying, and tiresome uphill work have been at last crowned with success, the credit for this success must rest at the door of organized medicine. No one man, nor any group of men, no one society, nor any one committee has carried the burden alone, but I cannot let this opportunity go by without saying that at least four men deserve the gratitude of the entire profession. Three of these constituted the advisory or consulting committee arranged for with Premier Drury last January. Dr. Edmund E. King, of Toronto, represented the College of Physicians and Surgeons, Dr. J. C. Connell, Dean of the Medical Faculty of Queen's University, represented the Universities, and Dr. T. C. Routley represented our Association. The work of this committee needs no commendation from me. They undertook a difficult task, and they carried it through to a successful result. What more can be said? The fourth gentleman whose name I would like to mention was not a member of this committee, but I am sure that his years of thought, and of preparatory constructive work, did in some measure pave the way, and assisted in overcoming many of the difficulties. I refer to Dr. John Ferguson, now for some years the chairman of the Committee on Legislation of the Ontario Medical Association. I feel also that the thanks of the Association are due to Premier Drury for the sympathetic understanding, and support which he gave to the Bill.

Another matter which I feel sure should be the subject for congratulation is the improvement in the relations between the medical profession and certain executive boards appointed by the Government, which has taken place during the past year. Much of this improvement can be directly attributed to the appointment of advisory committees from our Association, and the willing acceptance by the boards of suggestions emanating from these committees. Problems connected with the working of the Ontario Temperance Act have been largely eliminated, and most harmonious relations exist between the Board of License Commissioners and the profession. While the Workmen's Compensation Board is still the target for some adverse criticism we are happy to be able to report that an *entente cordiale* has been established, and that matters concerning their *tariff* are in process of readjustment.

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*Delivered at the Forty-third Annual Meeting of the Ontario Medical Association, Windsor, Ontario, May 30th, 1923.

The programme of the Committee on Education, having special reference to the development of post-graduate extension lectures, has been an unqualified success, full details of which will be found in the report of the Committee. Much credit should be given to the members for their energetic work, and sincere thanks both to the Ontario Division of the Canadian Red Cross for their much appreciated financial assistance, and to the medical faculties of the three universities for their co-operation in building up a schedule now comprising upwards of three hundred and fifty medical and allied subjects. It is also a matter for pleasant observation that this activity of our Association should have become the subject of much kind comment from various similar societies, not only in Canada, but also in several societies in the United States as well. To such an extent is this the case that our secretary has been specially invited to deliver an address to the coming meeting of the California Medical Association, on the methods by which this programme has been brought to its present state of efficiency.

There is, as I see it, only one serious objection to the present system of extension lectures, and this fault is one which is recognized by the Committee, and the methods for correction of which have been indicated. I have previously on several occasions pointed out that these lectures should in no way interfere with, or diminish the activities of the individual members of our county societies. Unfortunately it is relatively much easier for the programme committee of a local society to say, "We have eight lectures offered to us by the provincial association. These will do nicely for the eight monthly meetings comprising our yearly session," than to stimulate local interest to the extent of securing papers or clinical talks from their own members. This is a tendency which, if allowed to grow, will work very serious harm, a harm which may, indeed, outbalance the undoubted benefits derived.

While great improvement has taken place during the past few years in the organization of the medical profession, there is still room for further progress in this respect. A careful survey of the situation reveals the fact that out of the thirty-five hundred practitioners in the province, there are about one thousand who, for various reasons—old age, retirement from active participation in practice, and owing to certain personal viewpoints, cannot be considered as potential elements in a constructive sense. Added to these is another five hundred, who, under our present constitutions are not eligible for membership on account of not belonging to the local society. Our possible membership is, for these various reasons, reduced to approximately two thousand. At the present date, May 30th, we have a paid up list of sixteen hundred and seventy-eight. There are, therefore, three hundred medical men in this province who should belong to our organization who do not do so. We need these men, we need the support, encouragement and strength that their membership would give us, and I think that I am safe in saying that these men need us, that no investment that they could make would, in the years to come, yield greater monetary and other returns than the amount expended in the membership fee of the provincial association. There are still a few, a very few, counties or districts that are without an organized medical society, and there is also an occasional society that has, as yet, not affiliated with our organization. May I express the earnest desire, and the hope, that by the time for our next annual meeting all of these defects will have been corrected.

For two years prior to my assumption of the presidency, I had the honour to be the chairman of your committee on hospital standardization. In 1921, at Niagara Falls, this committee presented a report which was unanimously adopted, outlining certain minimum requirements, and recommending that the Ontario Medical Association should lend the weight of its influence towards having every hospital in the province brought up to these standards. Again, in 1922, at Toronto, this recommendation was unanimously endorsed. This year, under the able chairmanship of Dr. Mowbray, the committee is able to report progress, and a gratifying improvement in conditions. Yet, of the fifty-four hospitals in the province, only twenty-seven, or fifty per cent., have come up to these minimum requirements, a considerably lower percentage than that of any other province in the Dominion. Two factors have seemed to me to be largely responsible for this undesirable state of affairs, and these two of entirely different origin, and in a measure, at least, applicable to quite different groups of hospitals. To-day our larger hospitals, especially those providing clinical material for medical teaching, are practically all standard hospitals, and yet one occasionally hears members of the staff of these institutions speak in at least a very lukewarm manner concerning the value of hospital standardization. This attitude seems to find its origin, and explanation, in a definite objection to the activities of the organization which at first attempted a hospital survey on anything approaching a broad scale.

The second factor is more widespread, and more difficult to handle. It is evident largely in the smaller hospitals, and in those unconnected with teaching institutions, and perhaps I may add in those where the value of the opportunity to avail themselves of hospital facilities is not appreciated by a proportion of the medical staff. This factor displays itself in a passive resistance on the part of certain physicians to any innovation which requires any increased mental or physical effort. They object to writing case histories, or to having them written; they object to obligatory pathological examinations; to staff conferences; to end-result summaries, or to any other procedure which will entail any disturbance of their habitual routine. There can be no question but that improved hospitals have resulted from the standardization campaign, and that these improved hospitals are a distinct benefit both to the patient and to the doctor. Lest there still exists any misapprehension as to what is meant by hospital standardization permit me to say that, "A standard hospital is merely one which can demonstrate that it offers to the sick those minimum requirements which collectively guarantee efficiency of service." Is there a physician anywhere, who should not be found in the forefront of the battle to secure these conditions in every hospital in our province, and yet I have to say, regretfully and with a keen sense of disappointment, that by far the greatest single factor in preventing progress along these lines is the attitude of part of the medical profession.

During a recent visit to Central and South America, two observations struck me as of great importance First, that only a quarter of a century ago Havana, in Cuba, and the Isthmus of Panama were veritable hotbeds of malaria and of yellow fever; under the direction of one man, by methods of sanitation in its broadest sense, this was within a comparatively few years all changed. Havana has become a great safe, winter play-ground, the canal has been finished, and the zone to-day is a healthy area, and by the adoption of the same methods, practically every city in South America has freed itself of these diseases.

To General Gorgas is due the credit, and you will be pleased to know that while in Panama we were privileged to participate in the ceremony of laying the corner stone of the Gorgas Institute of Tropical Medicine, which for centuries to come will keep alive the memory of his beneficent influence on the health of mankind.

My second observation was not so pleasing. At Rio de Janeiro an international exposition was in progress, and one building was largely given up to public health propaganda. Among other things they had a very striking exhibit illustrating the ratio to population of the occurrence and mortality of scarlet fever and of diphtheria in all of the largest cities of the world, and I regret to state that the largest city in Canada had the unenviable position of heading the list with the highest ratio in both diseases.

Now, the moral that I would deduce from these two observations is this, that in a given locality, if the right man can be found, and he can be invested with semi-military or almost autocratic power, wonderful things can be accomplished by preventive medicine alone, but also that in our ordinary civil life, with our medical profession functioning as it is, the best possible results in safeguarding the health of the community can only be attained by a very close co-operation between the public health worker on the one hand, and the private practitioner on the other. While here in Ontario this close co-operation does exist, it would be futile to say that there have not been, or are not certain difficulties. Many of these develop in connection with certain offshoots of preventive medicine in the form of clinics which at times appear to infringe on the legitimate field of the private practitioner. Obviously, a "Well Baby Clinic" is not intended to formulate plans for the artificial feeding of infants, to advise concerning the treatment of developmental defects such as hernia, or to prescribe for such conditions as conjunctival infections and skin diseases. Yet all of these things have been done in these establishments. Notwithstanding every effort to prevent it, venereal clinics do occasionally treat patients who ultimately are found quite well able to pay a physician. I am able to make this statement the more definitely because I happen to be the director of one of them. How frequently do we see in the newspapers the monthly report of a school nurse, which reads somewhat as follows: Children inspected, 600; abnormal conditions found, 100; treatment instituted, 30.

A considerable proportion of these difficulties may be attributed to the attitude of mind of the salaried official school inspector, social service nurse, or secretary, connected with those organizations which are controlled by a lay board. This board is frequently composed of eminent business men who estimate the need for, and success of, these various undertakings by the volume of turn over, or in other words the number of patients seen. Unconsciously, this so reacts on the mind of the responsible official, the more so the more they are really interested in the work, that they take pride in showing a monthly or quarterly increase in the attendance, which occasionally, at least, causes them to lose sight of the original object for which the undertaking was established.

A paper recently published in the *American Journal of Public Health*, by Robertson, of Chicago, has raised considerable discussion. In it the author charges the general practitioner with nearly all the ills that flesh is heir to, at least so far as public health work is concerned, and especially complains of the physician's attitude towards notices of disease sent by, for instance, school inspectors, to the parents of children. He claims that when the parent does as he is asked, and takes the child to his doctor, the latter makes light of the notice, treats it with scorn or contempt, and generally speaking fails to act upon it, whereas the author feels that he should regard it in the same light as if another practitioner had referred a case to him for advice or treatment. There is a measure of truth in both statements, but at least a partial explanation is quite easy. The parent does something which he is asked to do by the school inspector, not something that he decides to do on his own initiative. Frequently, also, he can detect no evidence of disease, and therefore no need to see a physician. In the vast majority of cases, at least ninety per cent. in my experience, where the parent does as he is asked, and takes the child to a doctor he does not expect to pay that doctor for the advice received.

Some time ago there appeared in our *Bulletin* one of the most important communications that we have ever had to consider, a communication so well thought out, so well worded, and so pregnant with future possibilities that it could not fail to impress the reader. I refer to an article titled, "A Proposition Concerning the Enlightenment of the Public," and regarding the purport of which I may best refresh your memories by quoting from the prologue.

"We do not propose that the practising medical profession should teach public health or preventive medicine, these are well taught by public health specialists to the public already, but we do propose that the diagnostic and therapeutic medicine and surgery of every day practise should be explained, illustrated, and demonstrated by the profession to the Canadian public. This is the thing the public does not now understand, these are the things the public must understand if it is to give proper appreciation to scientific medicine, these are the things the practising medical profession must teach to the public if the public are to be taught at all along these lines."

There is no reasonable doubt but that such a proposition thoroughly, properly, and efficiently carried out, would be of enormous value to the public, and would enhance the reputation of modern medicine to a great degree. Certain objections will, of course, be advanced. I can see the word "advertising" already on the lips of many of you, but is not educational propaganda legitimate and ethical advertising? Have we not been advised, "Hide not your light under a bushel, but let it so shine before men that they may see your good works." To my mind the greatest objection is the difficulty in securing the proper type of speaker to carry out the programme efficiently. This point has been well covered in the article referred to, and I need not here dilate upon it. Suffice it to say that in my opinion this is potentially a most important subject, and one well worthy of much study and of sincere attempts at development on the part of the "Committee on the Interrelations between the Medical Profession and the Public."

There is one matter, however, which requires reference and merits recognition. Although the Hodgin's Report *per se* was not specifically referred to during the introduction and passage of recent legislation, we must not forget that it has been in large part adopted as constituting the "Articles of Faith" of our profession, and as including those recommendations most likely to improve the quality of service, and also protection to the servant. We must remember, and emphasize, that the first four recommendations in the conclusion to that report refer to the introduction of proper means and methods for the teaching of physical therapy in its broadest sense to the medical undergraduate. It seems to me that the *Medical Act of 1923* has indirectly thrown a very decided responsibility on the medical profession, and the teaching faculties, a responsibility which must be assumed and properly dealt with if we are to conscientiously feel that we are living up to our ideal of the best possible medical service.

There is also the problem of the recent graduate, and following this again, that of the graduate of more or less extended experience, who desires to confine his practise to one or other of the specialized branches of work. The first is, in part at least, a problem of the hospital interne. At present we have two difficult situations to face. The larger of our hospitals, especially those connected with the teaching faculties can easily secure all the internes that they need by a natural process of selection. The next larger hospitals also secure their quota usually by the added attraction of a small monetary *honorarium*, while our smaller hospitals cannot secure the internes they need even by the payment of a much larger remuneration. There is no doubt in my mind that this is partly at least due to the fact that the prospective interne prefers service in the first mentioned institutions because he gets better return in experience for the time spent. Whether we approve of hospital standardization or not, the fact remains that the standard hospital, by and largely, can secure practically all the internes they want, while frequently the others cannot secure them at all. The second unfortunate fact is that almost fifty per cent. of our recent graduates are to-day seeking interne positions in the United States, rather than remain in Canada. Why? I will allow those of you with interne experience to answer the question.

It has been felt for some time that we should have here in Canada some mark or degree to signify the attainment of higher qualifications in the lines of specialized work. It has been felt, for instance, that one holding himself out as a specialist in surgery should present evidences of his fitness. The Fellowship of the Royal College of Surgeons of England, is perhaps beyond the financial ability of many of our younger men, while that of the American College of Surgeons has not, strictly speaking, confined itself to the purposes which was originally said to be its intent. Efforts have been made to arouse interest in a Canadian institution, founded more on the lines of the former than of the latter, and perhaps affiliated therewith. If this association, or perhaps better, the Canadian Medical Association, should actively interest itself in the organization of some such a body, and should, as part of its effort, include the distribution of recent graduates as internes to those hospitals which offer sufficient scientific and clinical training, and still further should arrange that this latter training would form a stepping-stone to a higher degree indicative of merit, many of these problems would be on a fair way to solution. I understand that the Canadian Medical Association already has a committee to consider these matters, and I trust that their efforts will eventually be crowned with successful accomplishment.

Spontaneous Rupture of the Heart in a Case of Ulcerative Endocarditis.—The symptoms reported by Thomas A. Claytor, Washington, D.C., as manifested in a man, aged 58, were those of septic endocarditis. The diagnosis was confirmed by positive blood findings which showed *Streptococcus viridans* in pure culture. In a few days, the patient complained of sudden pain in the heart, and he died in a few minutes; probably from shock, as the internal haemorrhage was small. The necropsy findings were typical of septic endocarditis. In one area on the superior posterior aspect of the left auricular appendix, rupture had occurred, and free blood had seeped into the pericardial cavity. A good sized clot plugged this aperture.—*Jour. Am. Med. Assoc.*, May 12, 1923.

RECENT PHARMACOLOGICAL STUDIES IN INTESTINAL PERISTALSIS*

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In the last few years our knowledge of the movements of the intestine and of their control has developed greatly, many difficult points have received their explanation, though there are certain great problems still to be solved.

I intend to speak to-night mainly of the small intestine. This part of the gut has a thin wall of two muscular coats, longitudinal and circular; between them lies the important nerve plexus of Auerbach, a survival of the most primitive type of nervous system. Its nerve cells are all important for carrying out both types of muscular movement. The muscle cells deprived of this nerve net are no longer inherently active. (Magnus).

The movements of the intestine are of two types. First, the rhythmic or pendular contractions of longitudinal and circular coats are local in character and are not propagated along the gut. They serve for the thorough mixing of the food and facilitate its absorption. Second, peristalsis, consisting of a local area of shortening of longitudinal and circular coats, producing in the normal gut a deep ring of contraction 1-3 cm. wide, almost completely obliterating the lumen, which passes down the canal preceded by an area of inhibition or quiescence. This ring moves slowly, usually not more than 5-10 cm. per minute. Normally, both these types of movement may be increased by distending the gut. (Bayliss and Starling,[2] Trendelenburg[14]).

The external nerve connections influence both these movements. The vagus nerve if stimulated may increase movements of both types. There is good reason to believe that its fibres pass to nerve cells in the plexus which in turn send branches to the muscle fibres. The sympathetic has its nerve cells in the coeliac axis or other ganglia external to the gut and it is believed that its fibres pass to the muscles direct. Its stimulation decreases movement.

Fröhlich and Meyer[4] have recently clearly demonstrated that the sensory nerve fibres which end in the gut, arise from cells in the dorsal roots, and pass *via* the white rami to the gut along with the sympathetic fibres. It is very probable that short lateral branches pass into the nerve network in the gut and possibly also into the sympathetic ganglia which they pass *en route*. Their stimulation may thus affect both local reflexes and more distant ones from the spinal cord or the sympathetic ganglia.

But there is another neuro-muscular mechanism which is not so well understood. With it the surgeon and pharmacologist is quite familiar. This is the tonus of the gut, the state of contraction on which the other movements are superimposed. (See Fig. 7). The gut in good tonus feels firm; in low tonus, soft and flabby. This tonus depends, also, on the nerve-net and can be influenced by its nerve connections. It is increased by vagus stimulation and decreased by that of the sympathetic.

The vagi may be cut and in a few days the movements are normal, though the tonus is slightly lower and peristalsis less rapid. The sympathetics may be also cut, and again the movements soon become normal, though slightly more rapid and with a higher tonus. The work of Cannon[3] has been well confirmed by that of Koennicke[6].

Cannon first called attention to the fact that good movements were only to be obtained when there was adequate tonus and this is doubtless true.

Trendelenburg[14] invented a useful method of studying peristalsis in the isolated organ. The diagram, Fig. 1, shows it in a simplified form. The gut should be immersed in oxygenated Ringer solution. As the pressure bottle is raised, the fluid passes into the gut which, as it distends, shortens, and the upper lever rises, as the content of fluid in the bottle decreases, the volume recorder falls. Suddenly a wave of peristalsis arises at the upper end of the gut and, sweeping

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*Read before the Academy of Medicine, Toronto, Tuesday, November 21st, 1922, Sections of Medicine and Surgery.

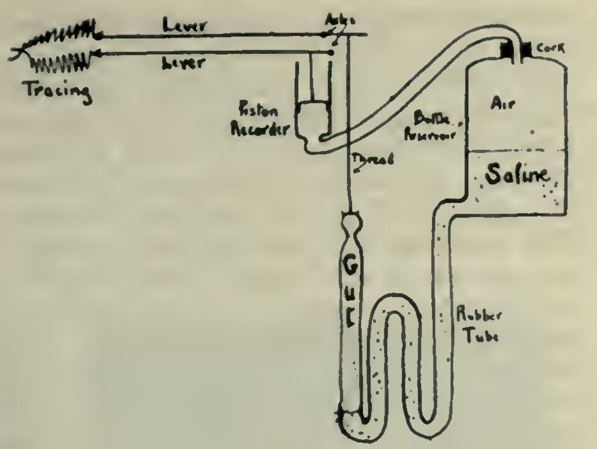

FIG. 1

down, drives the fluid back into the bottle. This is repeated again and again, but the gut soon tires. When this occurs the gut relaxes, is distended and quiescent. This tiring occurs sooner if the tonus be low or the internal pressure high. If the gut tonus be raised, a lower internal pressure will set up the peristalsic movement, while if it falls a higher pressure is required, and one can see that the peristaltic contractions are not so deep and, consequently, less efficient in driving the water back into the bottle. Smaller waves are recorded by both levers.

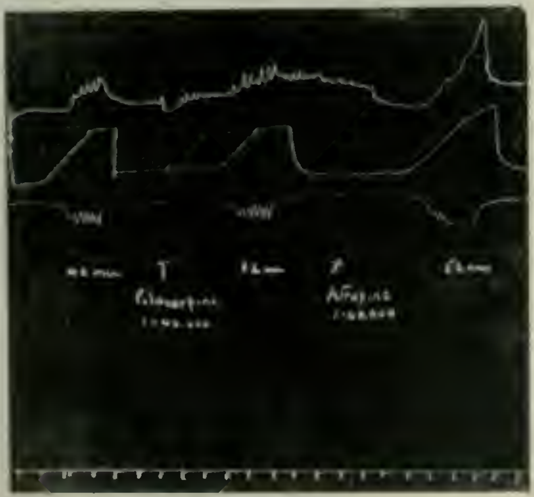

FIG. 2

In Fig. 2 it may be seen that when the pressure (middle curve) rose to 42 mm. of water peristaltic waves occurred. After pilocarpine was given the tonus rose and small rhythmic contractions of the longitudinal muscle are evident. When the pressure was raised peristaltic response occurred at a pressure of 32 instead of the previous 42. After atropine there was a fall of tonus, and movements were absent with a pressure of 52 mm.

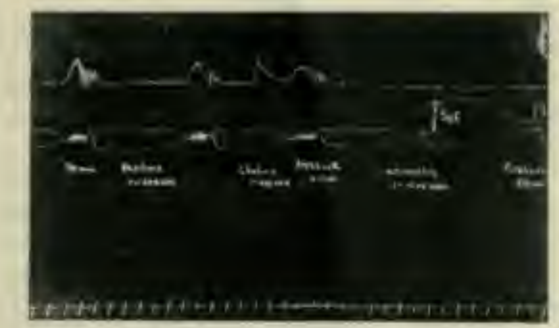

FIG. 3

In Fig. 3, which closely follows Fig. 2 in time, the effect of barium is shown. A pressure of 22 mm. caused active peristalsis which, however, soon failed with distension of the gut as is shown by the upper tracing.

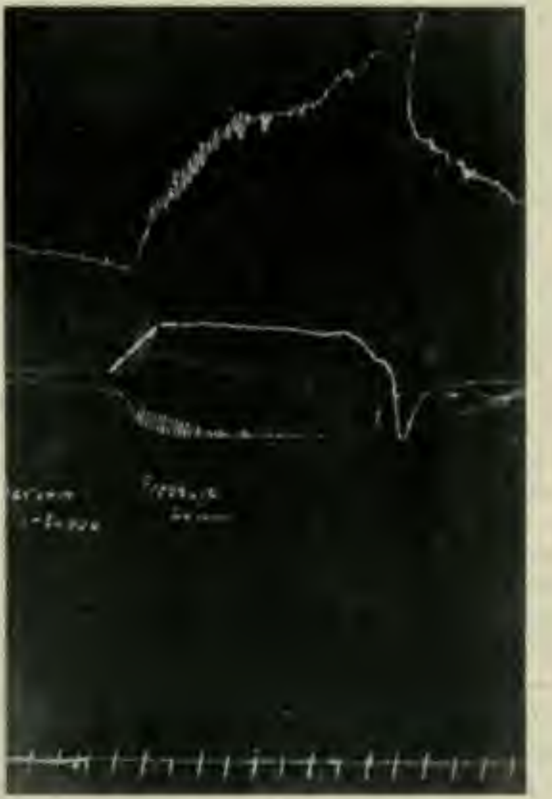

FIG. 4

In Fig. 4, normal peristalsis occurred with a pressure of 30 mm. Choline 1-400,000 caused no change. 1-40,000 made the gut more sensitive responding at 25 and adrenalin 1-1,000,000 lowered the tonus and no peristalsis was produced by a pressure of 50 mm. The efficient stimulus to the gut is pressure on its walls. The pressure at which this stimulus is effective depends on the tonus of the gut.

Pilocarpine and physostigmine increase tonus and movements because they act, we believe, in the vagus endings, stimulating them. Pituitary will also increase tonus and movements, but because of an action on the muscle cells.

Atropine causes a fall of tonus due, it is supposed, to an action on vagus endings, but while, when a dose 2-3 times the therapeutic one of 1/100 gr. has been given, stimulation of the cardiac vagus fails to inhibit the heart, stimulation of the intestinal vagus will produce movements often as great as before. (Bayliss and Starling[2], Henderson[5]). If the dose be larger the movements are less efficient than normal. This is why atropine is so valuable in intestinal spasm. It relieves the spasm without abolishing movements of a normal type, or the normal central control. After large doses of atropine, peristalsis, if obtained by stimulation, is often rapid but very shallow, the waves cut so little into the lumen as not to move the contained fluid. They are then almost impossible to record.

I was prompted to offer this paper for two reasons. The first was that, when in some recent experiments I obtained this low tonus, either due to the action of drugs such as atropine, or due to some unforseen cause, I always tried to remove it. Where it was due to atropine or adrenalin and I acted quickly, barum chloride or pituitary was effective, but not if I waited long. When it occurred spontaneously, pilocarpine, physostigmine and choline reduced it, if promptly used, but not if long delayed.

In one series of experiments I tried to control conditions by imitating the Trendelenburg method referred to, on the intact animal. After opening the abdomen under warm saline as, if this be done, the movements are more regular and active, I inserted a small hypodermic canula into the lumen of the gut, this canula communicated with a pressure bottle which would supply a constant stream of warm water. Then, some ten inches lower down I transected the gut and tied in a large canula which was connected with a rubber tube. The fluid flowing into the gut both flowed and was carried by peristalsis down to the lower tube. By raising the outlet of the latter, I could change the pressure in the gut.

In one or two cases the gut and not only the part handled but the whole gut became flabby, and neither vagus stimulation nor drugs produced any movements or only very ineffective ones. But, as a rule, when the gut lost tonus, vagus stimulation and especially such drugs as pilocarpine, physostigmine or choline increased the tonus and vagus stimulation then produced fair movements. But if, after long distension from inflowing fluid, and too great pressure, the gut became very flabby, neither drugs nor nerve stimulation sufficed to produce movements that I could see, and certainly none that I could record. These experiences taken in conjunction with talks with surgeons and a review of their literature, have convinced me that once bowel tonus has fallen and distension has been in existence for some time, pharmacological methods are valueless. Consequently, I feel that pharmacological help should be called in early. How early symptoms of intestinal stasis can be detected by the surgeon I know not, or whether it could be detected earlier than it often is I do not know, but I feel that in any case where I had the least dread of distension developing I would use drugs early. Physostigmine would be my first choice in repeated small doses 1/64 gr. every three hours.

My second reason for this paper is due to some work carried on at Utrecht during the past four or five years and which has reached a point where it may become of practical importance. Weiland[15] working under Magnus, the pharmacologist, found that if an isolated piece of gut tied at both ends were left in a vessel of oxygenated saline something diffused into the water which had the power of increasing the movements of another strip of intestine, set up by the Magnus method represented in Fig. 5.

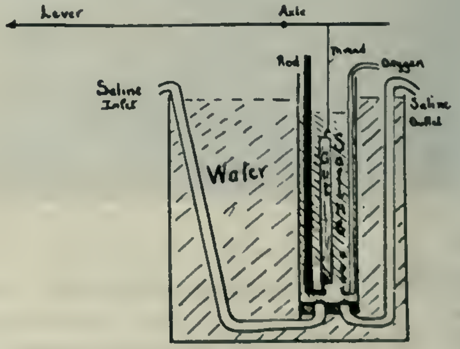

FIG. 5

(In an outer water bath kept at constant temperature is an inner cylinder filled with Ringer's solution. This solution is kept saturated with oxygen by running in this gas through a fine tube.

Affixed at its lower end to a glass rod, and at its upper end to a lever, a small section of rabbit intestine is lowered into this oxygenated Ringer. The lever records the rhythmic movements of the longitudinal muscle fibres). This substance was produced by all parts of the gut. Le Heux[7] showed that this substance was choline, a well-known body produced by the digestion of certain foods, *e.g.*, lecithin.

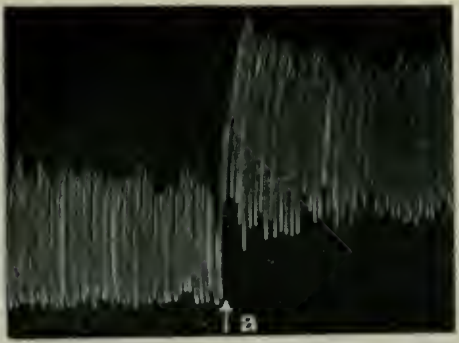

Fig. 6

In Fig. 6, at the point "a," a little choline was added to the solution. There is an increase in tonus and rhythmic movements.

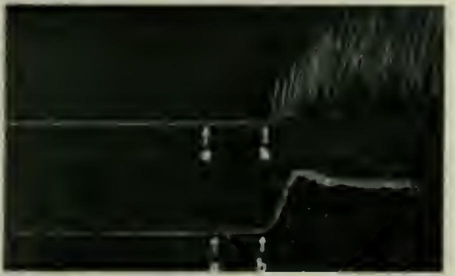

Fig. 7

In Fig. 7, the curves are from different experiments, but in both a gut strip almost quiescent was aroused to activity by the addition of fluid in which another strip has been immersed for a time. This fluid contained choline. Magnus[9] suggested that in choline we have a hormone which maintains the activity of the gut. Though I am not entirely satisfied that this theory is valid or that the presence of choline is more than incidental, yet it has attracted attention to a drug that might well be used.

Kühlewein and Arai[1] have indeed laid the foundations for its clinical application. By the use of the Roentgen rays the former showed that the guts of cats after a prolonged anaesthesia showed very sluggish movements, or none at all, but that if an injection of choline were given the movements became promptly of a normal type. Arai produced intestinal paresis by opening the abdomen, handling a section of gut, then returning the same and closing the abdomen.

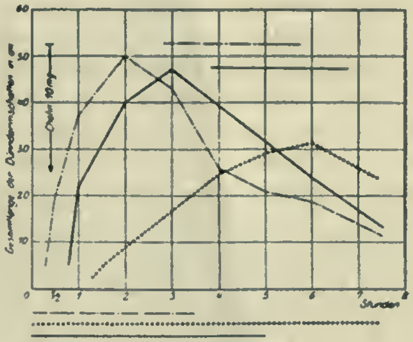

Fig. 8

His results are shown in Fig. 8, in this the dash and dot curve shows the length of small intestinal shadow after a bismuth meal in a normal animal plotted against hours of time as abscissae. The line of crosses shows similarly the intestinal shadow after the gut had been handled and the heavy entire line gives the curve after handling and choline. It will be seen that this curve approximates the normal one. Below the curve proper by corresponding lines are shown the number of hours which the stomach took to empty. It will be seen that choline again materially reduced the time as compared with a handled gut to which no choline was given, and caused it to approach normal. Further, if strong tincture of iodine be injected intraperitoneally into cats, a sero-fibrinous peritonitis ensues, with a very marked slowing of intestinal movements. This condition also is promptly overcome by the injection of choline. This is well illustrated by Fig. 9.

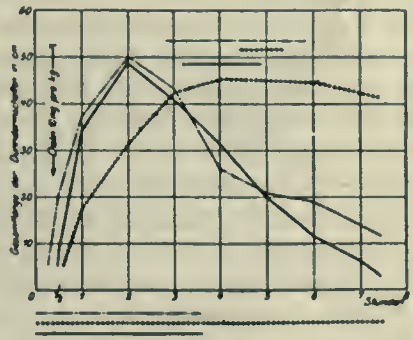

Fig. 9

In this figure it may be seen that the dot-dash normal curve and the heavy one representing iodine peritonitis treated with choline are closely parallel, while the crossed line of iodine peritonitis alone shows very great delay. These authors used intravenous injections of choline hydrochloride 10 mgms. per kilogram of body weight. 35 mgms. per kilogram is fatal, 30 mgms. per kilogram highly toxic.

These experiments are sufficiently striking to attract attention and choline may, ere long, be added to our armamentarium. At the present time *pure* choline is not easily obtained, though as Mendel has shown, it is fairly stable when synthetically prepared in a pure form. In the doses used by Arai and Kühlewein, it causes a temporary fall of blood pressure lasting 3-4 minutes, but a more prolonged flow of secretion from the salivary glands and tear glands, 8-13. Were I a surgeon I would, for the present, prefer to employ physostigmine in small doses 1/64 gr. or even less.

In connection with my experiments, I made another observation which appears to me of value to the surgeon. When intestinal tonus was low after distension and the gut contained a quantity of fluid sufficient to fill it, the peristaltic waves which occurred were very shallow and had no effect in moving the contained fluid. Respiratory movements, however, were effective and the fluid gradually passed upwards, entered the stomach, and was vomited. This I feel sure is a truer explanation of the faecal vomiting that occurs in cases of intestinal stasis than is the one of reversed peristalsis usually given. A true reversed peristalsis has, I believe, never been observed.

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Geographic Distribution of World Disasters.—Among the questions with which the League of Nations had to deal at the Genoa Conference was the draft of a constitution and by-laws for the proposed *Oeuvre international de secours et d'assistance aux populations frappées de calamités.* This project, which is fostered by Senator Ciraolo, president of the Italian Red Cross Society, is an endeavour to induce the signatory powers of the Geneva Convention to enter into a new agreement which would give further recognition to the Red Cross in its peace rôle and, more particularly, in its function as an aid in great public calamities. The international organization, according to Ciraolo's plan, must be "one and universal, and must remain neutral in all matters pertaining to politics, religion and race."

Since, as a rule, great catastrophes and public calamities come suddenly, taking their victims unawares, it seems rational to establish an international society so organized as to be able to render immediate aid in case of need. The representatives of the international society will need to study the history of different peoples and the catastrophes to which they are exposed, in order to be prepared to provide adequate assistance in time of need. It has, therefore, occurred to the international committee of the Red Cross that it might be advisable to publish a map of the world showing the distribution of the various types of calamities that overtake, from time to time, different regions of the globe. This task has been undertaken by M. Raoul Montandon, president of the *Société de géographie of Geneva*, who has just published an important article on the subject in the *Revue internationale de la Croix-Rouge.* It has been found that the expense of publishing such a map in colours would be too great; for this reason M. Montandon has found it necessary to confine himself to the publication of a series of smaller maps in black and white. There will be separate maps showing the distribution of earthquakes, tornadoes, cyclones and typhoons, droughts, floods, famines, bubonic plague, cholera and yellow fever, and other calamities.—*Letter in Jour. Am. Med. Assoc.*

A Form of Polypoid Colitis as a Late Stage of Amebic Dysentery.—In a case of amebic dysentery seen by Laurence E. Hines, Chicago, the colon mucosa presented no gross signs of ulceration, but was the site of multiple confluent polypoid masses.—*Journal A.M.A.*, July 7, 1923.

OBSERVATIONS WITH INSULIN ON DEPARTMENT OF SOLDIERS' CIVIL RE-ESTABLISHMENT DIABETICS*

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THE object of this paper is to give a brief report of the recent work on diabetes mellitus in the Soldiers' Civil Re-Establishment, and to present to the physician an outline of insulin treatment of diabetes, which may assist him in the management of cases, when insulin is available for general distribution. The report, therefore, will not give in great detail the laboratory findings obtained by methods which are not available to the general practitioner. The diabetic cases receiving insulin at the Christie Street Hospital of the Department of Soldiers' Civil Re-Establishment are men who acquired this disease during, or shortly after, the Great War. The patients, whose ages range from twenty-five to fifty-three years, are practically all severe diabetics. There are, however, two moderately severe cases and one mild case. Previous to their admission to hospital, all of the patients were glycosuric and were progressing unfavourably under dietetic treatment and, with one exception, they all showed ketosis.

The daily routine urinalysis includes the volume of the twenty-four hour specimen, the specific gravity, the reaction, and tests for albumen by heat or nitric acid. The acetone bodies are estimated by means of the Rothera and ferric chloride tests. The sugar determinations are done by means of the Benedict qualitative and quantitative solutions. In addition to the above, the blood sugars are estimated by means of the Schaffer-Hartman method and the respiratory quotients with the Douglas bag and Haldane gas analysis apparatus.

After a careful history has been taken, the patient is given a complete physical examination. Special attention is directed to the finding of foci of possible infection. The teeth, tonsils, accessory sinuses, chest and digestive system are examined clinically, as well as by X-ray. Special consideration is given to biliary tract infection, constipation and chronic appendicitis. If any source of septic absorption is located it is appropriately treated, since such conditions may lower carbohydrate tolerance. The eye grounds are examined for a possible diabetic retinitis or neuro-retinitis.

At first the patient continues on the same diet as that previous to his admission to hospital in order to obtain some idea of the severity of his case, and to avoid complications from sudden changes of diet. Coma will be discussed separately. On the second or third day he is placed upon a diet the caloric value of which is calculated on his basal requirement. This is determined from Dubois' chart and Aub-Dubois table. It has been estimated by Marsh, Newburg, and Holly[1] that the body requires two-thirds of a gram of protein per kilogram, (1 kilo = 2.2 pounds), of body weight per day, in order to maintain nitrogenous equilibrium. The remaining calories must be supplied by carbohydrate and fats in a ratio that will prevent the production of ketone bodies.

The patient remains on this basal requirement diet at least a week. During this time, blood sugar is estimated before, and three hours after, breakfast, in order to determine the fasting level and the effect of food. The quantity of sugar excreted is estimated daily, and this amount subtracted from the available carbohydrate ingested gives approximately the utilization. The available carbohydrate includes fifty-eight per cent. of the protein, ten per cent. of the fat, and the total carbohydrate in the diet. It may be noted that when a patient is placed upon a diet in which the protein, fat and carbohydrates are balanced, that the amount of sugar excreted soon approaches a fairly constant amount, whereas, if the diet is not well adjusted to the patient's requirements, there is wide variation in the amounts of sugar excreted.

If a patient becomes sugar-free and blood sugar normal on a basal requirement diet the caloric intake is gradually increased until sugar appears in the urine. The tolerance is thus ascertained. If a patient remains sugar free and has a normal blood sugar when on a diet containing five hundred calories above his basal requirement he is not considered sufficiently severe for insulin treatment at the present time, since five hundred calories over and above his basal requirement are sufficient for the needs of his daily activities. If, however, he is unable to metabolize this amount, insulin treatment is commenced.

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*The insulin used in this study has been prepared by the Connaught Laboratories, University of Toronto, or by the Eli Lilly Company, Indianapolis.

Diabetes mellitus is due to a deficiency of the internal secretion of the pancreas. The main principle of treatment is, therefore, to correct this deficiency.. If it is found that the patient is unable to keep sugar free on a diet that is compatible with an active, useful life, sufficient insulin is administered to meet this requirement.

Owing to the protein content of insulin, anaphylactic symptoms may follow the initial dose. Therefore, the patient is desensitized by the subcutaneous administration of one unit every twenty minutes, until five units are given. On the following day he is given the amount of insulin which is estimated will reduce his blood sugar to the normal level, and subsequent doses to maintain him sugar free.

The initial dose of insulin is difficult to estimate owing to the variation in potency and the variation in the effect of a given dose in different individuals. The unit of insulin is one-third the amount of active anti-diabetic principle required to reduce the blood sugar of a one kilogram rabbit, which has been starved twenty-four hours, to 0.045 per cent., (normal blood sugar of a rabbit is approximately 0.120 per cent). The unit is estimated from the blood sugar lowering effect on normal rabbits and consequently the assay is only approximate. In a moderately severe case one unit causes about 2.5 grammes of carbo hydrate to be utilized. In earlier and milder cases, as a rule, one unit has a greater effect, accounting for three to five grammes of carbohydrate. Consequently, a smaller dose is sufficient.

In severe cases insulin is administered subcutaneously three times a day, from one-half to three-quarters of an hour before meals. In rare cases a small fourth dose is given at bed time to control nocturnal glycosuria. The less severe cases can be satisfactorily treated on a morning and evening dose, or a single dose before breakfast. The skin areas used are the outer side of the upper arms, the thighs, the gluteal regions and occasionally the abdomen and chest. Rectal administration in alcohol has been attempted, but with little success. The large dosage, and consequently increased cost, and the unsatisfactory results render this method impracticable. Insulin has been administered subcutaneously in gum acacia, and in glycerine, in an attempt to decrease the rate of absorption. The persistent induration with the former procedure and the large amount of oedema with the latter, together with the meagre delay in absorption, have caused us to abandon these modifications.

When the insulin treatment is established, if sugar is present in the twenty-four specimen of urine, the dosage is gradually raised till the patient becomes sugar free. If he is not receiving sufficient food for maintenance, diet and dosage of insulin are gradually raised. When small quantities of urinary sugar persist, it is desirable to find out at what period of the day this is excreted. In order to do this, each specimen in the twenty-four hours is analysed separately. An increase in the dose previous to the appearance of glycosuria will prevent its occurrence.

In severe cases it has been found preferable to give the largest dose of insulin in the morning, and reduced doses throughout the day. For example, a patient may receive fifteen units in the morning, ten units at noon and ten units at night. If three equal doses are given there may be morning glycosuria and evening hypoglycaemia, whereas the extremes of blood sugar causing these conditions may be prevented by the above distribution.

From the establishment of the clinic in May, 1922, each batch of extract has varied in potency, owing to difficulties in standardization. Each batch was, therefore, tested by observing the fall in blood sugar in different patients. This was done in order to ascertain the efficiency of the material. The patient had breakfast about three-quarters to one hour before the first blood sugar was taken. Insulin was then given and the blood sugar was determined at hourly intervals. No food was ingested until the experiment was completed. With the early batches, it was found that on subcutaneous administration there was but little fall in blood sugar in the first hour. A large fall occurred in the second and third hours, and the blood sugar continued to decrease during the fourth hour. The level at the end of the fifth hour was the same or slightly higher than at the fourth. The following tables will illustrate representative cases:

TABLE I.

Date	*Case*	*Dose*	*Blood Sugar at Commencement*	*Blood Sugar ½ Hr.*	*Blood Sugar 1 Hr.*	*Blood Sugar 2 Hr.*	*Blood Sugar 3 Hr.*	*Blood Sugar 4 Hr.*	*Blood Sugar 6 Hr.*	*Blood Sugar 8 Hr.*
June 6	G.	1½ cc.	0.207%	0.215%	0.208%	0.171%	0.181%	.....	.....	.....
June 10	H.	3 cc.	0.500%	.....	0.500%	0.357%	0.348%	.....	.....	.....
July 5	G.	2 cc.	0.262%	.....	0.252%	0.186%	0.152%	.....	.....	.....
July 20	G_1	2 cc.	0.340%	.....	0.320%	0.268%	.....	0.280%	.....	.....
Aug. 25	G_1	1 cc.	0.242%	.....	.....	0.082%	0.092%	0.100%	.....	.....
Aug. 28	G_1	1 cc.	0.272%	.....	.....	0.092%	.....	0.112%	0.112%	0.118%
Dec. 2	G.	1 cc.	0.240%	.....	.....	0.090%	.....	0.132%	0.130%	.....
Without Feb. 9	*Food* O	½ cc.	0.180%	.....	.....	0.106%	.....	0.086%	0.082%	0.088%

The effect of the same dosage of extract on different individuals was found to vary markedly. In the accompanying graph, (Chart I), five patients, whose weights varied from forty-six to sixty-seven kilograms, each received two cubic centimetres of the same lot of insulin, and in four hours the blood sugars had decreased 0.012%, 0.044%, 0.128%, 0.146% and 0.180% respectively. It was found, however, that one patient would persistently give marked decreases in blood sugar after insulin, while in another the fall in blood sugar was persistently less. In our experience, the more marked decreases in blood sugar occurred in the milder cases.

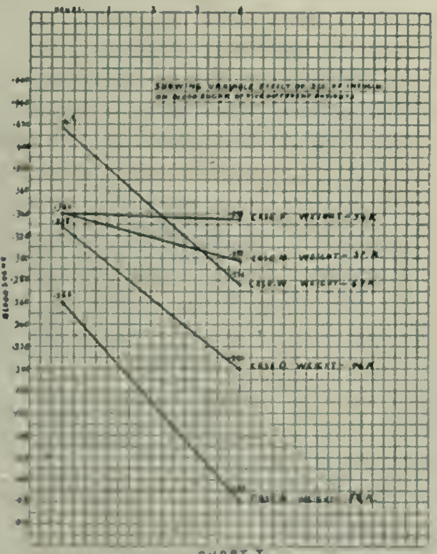

CHART I

In working out the carbohydrate utilization, the patient is allowed to go without insulin until his sugar excretion becomes nearly constant. Then he is given insulin, and the difference in sugar excretion between the former and latter periods is divided by the daily insulin dosage. Where the patient is on the same lot of insulin for a number of days the results are averaged. It is found that there is considerable variation in the amount of carbohydrate utilized per unit of insulin, but that in each patient the result of a given dose remains constant. The patient utilizes persistently either large or small amounts of sugar. The amount varies with each lot of extract, and bears a definite relationship to the potency of the extract as deduced from rabbit experimentation.

On injection there is local pain, due to the cresol preservative, but this disappears in from one to three minutes. Following this there may be in some induration at the site of injection which usually passes off in from twelve to twenty-four hours. With some of the earliest lots, this induration persisted as a hard, tense swelling with tenderness, but no local redness or heat. In from seven to ten days these areas, in a few cases, showed signs of redness and fluctuation and proceeded to abscess formation. There was little or no adenitis in the glands draining the area, no fever, and after incision and drainage the abscess cleared up rapidly. In one case only was the man's tolerance affected.

In two patients urticaria and fever occurred, but only persisted for two to three hours. In one case mild symptoms of anaphylaxis developed. During the last few months many of the objectionable features of the extract have been eliminated. There has been no abscess formation, but little induration, and no urticaria. The pain on injection has been markedly decreased.

The blood sugars of some of the patients were followed throughout the twenty-four hours and it was found that it was possible to gauge the dosage of insulin so as to keep the blood sugar within normal limits and still avoid the dangers of hypoglycaemia. The accompanying graph will illustrate this point. (Chart II).

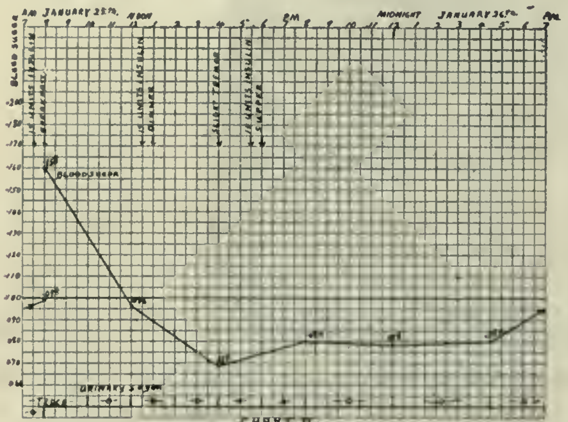

CHART II.

Coincident with the maintenance of the blood sugar at normal level the cardinal symptoms of the disease disappear. The patient loses the irritating thirst and dryness of the mouth and throat, and does not desire the large amounts of fluid with which he had previously tried to combat these symptoms. The lowered fluid intake diminishes the polyuria and from a twenty-four hour excretion of three to five litres the output falls to normal. The appetite which has been voracious is now satisfied with a normal meal, the carbohydrate of which is utilized, and the patient loses the persistent craving for food.

When a patient is given too large a dose of insulin there is a marked reaction, and the hypoglycaemia which develops gives rise to symptoms which are very similar to those observed in animals. The reaction begins in from one and a half to six hours after the patient receives the overdose. The average time is three to four hours. The interval varies with the individual, the dosage, and the food ingested. The first warning of hypoglycaemia is an unaccountable anxiety and a feeling of impending trouble associated with restlessness. This is frequently followed by profuse perspiration. The development of this symptom is not affected by atmospheric conditions. It may appear while the patient is in the frosty outside atmosphere, or in a heated room, and is independent of physical or mental activity. At this time there is usually a very great desire for food. No particular foodstuff is desired, but bulk of any kind seems to give satisfaction. At times the appetite is almost unappeasable. At this stage of the reaction the patient will notice a certain sensation as of clonic tremor in the muscles of the extremities. This can be controlled at first. Coordination, however, is impaired for the more delicate movements. Coincident with this there is a marked pallor of the skin with a rise in pulse rate to one hundred or one hundred and twenty beats per minute, and a dilatation of the pupils. The blood pressure during this period falls about fifteen to twenty-five millimetres of mercury, and the patient feels faint. The ability to do physical or mental work is greatly impaired. In a severe reaction there may be a considerable degree of aphasia, the patient having to grope for words. The memory of names and figures may be quite faulty.

On one occasion, a patient went down two flights of stairs to the dining room at 5:00 p.m., returned to the ward after his meal, and at 8:00 p.m. was found trying aimlessly to clamber up the wall. He remembered nothing from the time of going to supper till 8:30 p.m. when the ingestion of glucose relieved his symptoms. No actual convulsions or coma have been observed, as occur in animals[3], but if patients go untreated during this reaction, these may occur[4].

The onset of hypoglycaemic symptoms depends not only on the extent, but also on the rapidity of fall in blood sugar. The level at which symptoms occur is slightly higher in the diabetic with marked hyperglycaemia than in a patient whose blood sugar is normal. When the blood sugar is suddenly reduced from a high level premonitory symptoms may occur with a blood sugar between the normal levels of 0.100% and 0.080%, while the more marked symptoms of prostration, perspiration, and incoordination, develop between 0.080% and 0.042%. (0.042% is the lowest blood sugar we have observed during a reaction). As a patient becomes accustomed to a normal blood sugar the threshold of these reactions becomes lower. One patient who formerly had premonitory symptoms of hypoglycaemia at 0.096% now has no reaction at 0.076%, but symptoms commence between this level and 0.062%.

The ingestion of carbohydrate, in the form of orange juice, (four to eight ounces) or of glucose, relieves these symptoms in from one-quarter to one-half hour. If the reaction is severe, or if coma or convulsions occur, epinephrin or intravenous glucose should be given. The former acts in from three to ten minutes, but in order that the symptoms should not recur glucose must be given by mouth as soon as the patient has sufficiently recovered.

Following the relief of these symptoms the patient is usually dull and lethargic for several hours, but after this, physical and mental powers are markedly stimulated. He is then able to carry on his customary work with enthusiasm. Sometimes the feeling of depression lasts from twenty-four to forty-eight hours, during which time the patient is content to lie around or sleep because of the lack of physical energy. The patients are warned that when these reactions occur they are to report and obtain carbohydrate immediately. When outside the hospital, the patients carry with them glucose candy.

"Fats only burn in the fire of carbohydrate." The ability of the severe diabetic to burn glucose is markedly impaired, therefore the excess of fat is incompletely oxidized, giving rise to ketone bodies. These appear in the blood and urine as acetone, diacetic and betaoxybutyric acids. Insulin causes increased carbohydrate metabolism, and consequently fats are completely burned. This is substantiated by the fact that acetone and sugar disappear from the urine almost simultaneously following adequate amounts of insulin, as may be seen in the accompanying table. When insulin is discontinued, acetone bodies and sugar reappear in the urine.

TABLE II.—URINE

Time, June 19, 1922	*Dose*	*Vol.*	*Sugar %*	*Grs.*	*Acetone (Rothera Test)*	*Blood Sugar*
9:00 a.m.	——	60 cc.	1.7	1.0	plus, plus, plus	0.262
9:05 a.m.	2 cc. Insulin					
10:00 a.m.	——	75 cc.	1.6	1.2	plus, plus	0.252
11:00 a.m.	——	40 cc.	trace	——	trace	0.186
12:00 a.m.	——	65 cc.	——	——	——	0.152

Since the Rothera test is exceedingly delicate, (sensitive to 1 part of aceto-acetic acid in 30,000), patients on a high fat diet may be sugar free and still show traces of acetone bodies. A comparison with the ferric chloride test, (which is sensitive to only 1 part in 7,000) is, therefore, desirable. The persistence of ketone bodies in amounts which can be determined by the ferric chloride test necessitates either an increase in the carbohydrate or a decrease in fat of the diet.

When the production of acetone bodies is more rapid than the excretion they accumulate in the blood, giving rise to air hunger, drowsiness, and coma. The need of insulin is then imperative. After its administration the utilization of carbohydrate by the body gives complete combustion of the fats. When a patient is admitted to hospital in coma the blood sugar tests and a urinalysis are done as soon as possible. (The urine is obtained by catheterization if necessary). While these tests are being carried out the large bowel is evacuated with copious enemata. If the blood sugar is high and acetone present in large amounts in the urine, from thirty to fifty units of insulin are given subcutaneously without desensitization. Blood and urinary sugar should be frequently estimated because of the danger of hypoglycaemia. To prevent this from thirty to fifty grammes of glucose in ten per cent. solution are given intravenously. If the patient is profoundly comatose the insulin may be administered intravenously with the glucose.

The patient usually regains consciousness in from three to six hours. From this time on, fluids and glucose may be administered by mouth if retained. The patient should be urged to take at least two hundred cubic centimetres of fluid per hour. In from eight to ten hours the ketone bodies are markedly reduced. On the following day protein may be given every four hours as the white of one egg in two hundred cubic centimetres of orange juice. In two to three days, when ketone bodies have disappeared from the urine, fat is cautiously added, and the patient is slowly raised to a basal requirement diet. He is then treated as an ordinary diabetic. During the period of coma the patient is kept warm and toxic materials eliminated from the bowel by purgation and repeated enemata. A large amount of fluid is given to dilute the toxic bodies and promote their elimination. This may be administered intravenously, subcutaneously, or per rectum. If signs of circulatory failure develop these are treated by appropriate stimuation.

Striking results have been obtained with the above procedure. However, it has been found that the longer the period of untreated coma the more grave is the prognosis and the slower the recovery if it occurs. Cases complicated by severe infection, gangrene, pneumonia, or intestinal intoxication may recover from acidosis and coma, but succumb to the complication.

Marked lipaemia was present in three cases. This disappeared in the course of a week to ten days after the patient was placed on insulin and on a diet in which the fat was restricted. The urine of one patient became acetone-free while lipaemia persisted.

The respiratory quotient is the ratio between the volume of oxygen retained in the body from the inspired air, and the volume of carbon dioxide given off in the expired air, and is spoken of as the "R.Q." The patient breathes into the Douglas bag and samples of the expired air are analyzed in the Haldane gas analysis apparatus. When dextrose is burnt in the body the following equation represents the reaction:—

$$\underset{\text{(Dextrose)}}{C_6H_{12}O_6} - 6\ O_2 = 6\ CO_2 - 6\ H_2O$$

$$\text{R.Q.} = \frac{CO_2}{O_2} = \frac{6}{6} = 1.$$

Similarly the respiratory quotient for fat is found to be 0.71, and that of protein 0.82.

The severe diabetic, whose ability to burn carbohydrate is markedly impaired, has a persistently low respiratory quotient, from 0.7 to 0.8, which is but little raised by the ingestion of glucose; when glucose and insulin are given together the respiratory quotient is markedly increased, showing that carbohydrate is being metabolized. The highest values have been obtained when pure glucose was used with the extract. Less extensive rises have been secured when the patient, while on a mixed diet, received insulin. The accompanying graph represents a typical example.

"The patients who on admission are frequently dull, depressed diabetics with little hope for the future, soon become bright, cheerful and energetic. The discomfort of hypodermic injections is gladly endured for the benefits accruing from the treatment. Patients, who were hardly able to walk a quarter of a mile on the level, and who with difficulty ascended a flight of stairs, are now going for two to three mile walks daily, and enjoying them without fatigue. While in hospital, instead of pessimistically contemplating a downhill progression to diabetic coma, or a slow starvation, the patients are now engaged in vocational therapy, and vie in friendly rivalry with one another in attempts to make the most finished products. The well-known irritability of the diabetic vanishes, and in its stead is the sunny smile of a patient rescued from a lingering death, who gazes on the future with a feeling of confidence born of his own experience. He has found something which will enable him once again to earn his living. He realizes that he has attained to a diet which although closely regulated, will satisfy his hunger and his bodily needs. This change is so noticeable that strangers visiting the ward have remarked upon the contrast in the appearance of patients receiving insulin and those who have not yet commenced treatment."*

All the patients have gained in weight on the additional calories, examples of which are given in Chart III. There is an increase in sexual vigour and there is a greater ability to do mental and physical work. Five patients have returned to their former employment, and while still under supervision, they administer their own insulin and arrange their own diets with satisfactory results.

A typical example of the improvement in a case is the following. The patient, age twenty-nine, Canadian, had children's diseases, (measles, mumps, chickenpox) and paratyphoid fever at the age of fifteen. He also has chronic appendicitis. The family history is negative as to

TABLE III.

Urine Date—October 14th, 1922						Urine Date—October 15th, 1922					
Acetone	*%*	*Sugar*	*Vol.*	*R.Q.*	*Time*	*R.Q.*	*B.S.*	*Vol.*	*%*	*Sugar*	*Acetone*
Plus plus	8.9	6.9%	130 cc.	0.73	9.00	0.73	0.416	200	13.4	6.7%	plus plus plus
39 grs. Dextrose in coffee, no insulin					9.15	30 grs. Dextrose in coffee 3 ccs. insulin					
plus plus	16.5	6.1%	270 cc.	0.76	11.00	0.83	0.400	220	12.9	5.9%	plus
plus plus plus	28.5	5.7	500 cc.	0.77	1.00	0.87	0.320	190	9.8	5.2%	½ plus
plus plus	27.	6.3	430 cc.	0.73	3.00	0.94	0.216	188	8.6	4.6%	trace
plus plus plus	21.7	6.8	320 cc.	0.72	4.45	0.83	0.258	95	3.7	3.8%	trace

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*Written by one of the patients.

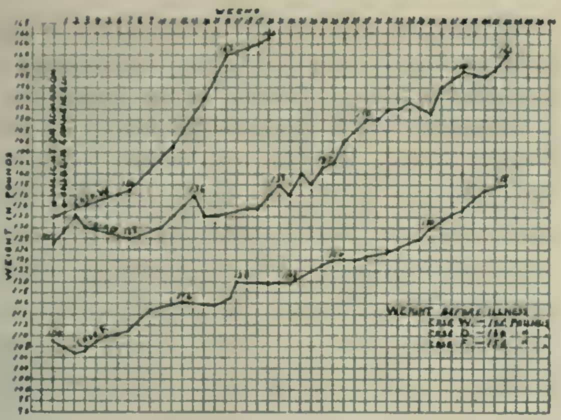

CHART III.

diabetes. The urine of the patient in December, 1916, was sugar free. About the middle of March, 1917, he suddenly developed polyuria, polyphagia and polydipsia, and lost fourteen pounds in weight in a fortnight. There was marked weakness. Urinary sugar was discovered to be as high as eight per cent. at this time. On April 4th, the patient was placed on Allen treatment, and slowly regained a tolerance of about two hundred grammes available carbohydrate. He returned to his army duties in September, 1917, and was able to carry on uninterruptedly until March, 1919. His tolerance had decreased during this time to about one hundred and fifty grammes. Following discharge from the army in March, 1919, the course of the patient was slowly downhill until October, 1921, when a particularly severe form of influenza shattered his tolerance. Up to this time the patient was maintained practically sugar free, but following the attack of influenza his tolerance fell to about sixty-six grammes of available carbohydrate. He began to lose weight rapidly. Thirst, hunger and polyuria returned. His strength diminished rapidly and, owing to mental and physical lassitude, he found it difficult to continue his work. Glycosuria became persistent and acetone bodies made their appearance and steadily increased. A distinct odour of acetone was at times distinguishable on the patient's breath.

On February 11th, 1922, this patient was taken to the Physiology Department of the University of Toronto, and the respiratory quotient was found to be 0.74, and unchanged by the ingestion of thirty grammes of pure glucose. Then 5 cc. of insulin were given subcutaneously, and within two hours the patient's respiratory quotient had risen to 0.90. The urine was sugar free and he had shaken off his mental and physical torpor. Following this experiment the patient did not again receive insulin until May 15th, as the product was being further improved. Since the latter date, the patient has been constantly on insulin with the following improvements. There is now no nycturia or polyuria and the urine is sugar-free or only shows slight traces. Thirst and appetite are normal. The patient has gained fourteen pounds in weight and is bright mentally and able to lead an active life. The blood sugars now remain within normal limits, and the graph showing the twenty-four hour blood sugars belongs to this patient. The contrast in the laboratory findings before and after treatment is evident from the table shown below.

There have been four deaths among patients receiving insulin treatment. One case of severe diabetes mellitus also had a four plus Wassermann, pulmonary tuberculosis, and very badly infected teeth. The second case had multiple abscesses. The urine of both of these cases was free of acetone bodies and of sugar before death. A third case, weighing seventy-six pounds on admission had advanced pulmonary tuberculosis, and although his diabetic condition was improved by treatment, he was unable to combat the complication. The fourth case was admitted in coma with a four plus acetone in the urine, 3.5% sugar, marked albuminuria with granular and hyaline casts. Three hours after administration of insulin and the intravenous injections of glucose, the patient recovered consciousness and remained conscious until his death two days later from circulatory failure and a diaphragmatic pleurisy. Death in each case has been due to complicating infections, rather than to the diabetic condition.

There have been no cases of diabetic gangrene, but a case of diabetes mellitus complicated with tuberculosis and double otitis media has been

TABLE IV.

Date	*Vol.*	*S. G.*	*React.*	*Alb.*	*Acetone*	*% Sugar*	*Grs.*	*Insulin*	*C.*	*P.*	*F.*	*Cals.*	*Wt.*	*B. S.*
12.5.22	2560	1035	Acid	..	....	3.5	54.6	0	42	101	159	2003	144	0.250
3.1.23	1456	1020	Acid	..	....	..	..	35 units	89	76	197	2423	158½	0.100

under treatment for six weeks. This patient is an open case of pulmonary tuberculosis with cavity formation. Previous to his admission, he had lost eight pounds in weight during eighteen months of sanatarium treatment, and was finding it increasingly difficult to keep sugar-free. He was placed upon a diet of 1,590 calories, and excreted approximately 28.2 grms. of sugar. Insulin was then administered and the patient is now sugar-free on 2,129 calories. (See table V). He has gained ten pounds in weight and his strength has markedly increased.

TABLE V.

Date	*Vol.*	*S. G.*	*React.*	*Alb.*	*Acetone*	*% Sugar*	*Grs. Sug.*	*Insulin*	*C.*	*P.*	*F.*	*Cals.*
1.1123	2560	1015	Acid	0	trace	1.1	28.2	0	31.5	80	1271	1590
13.2.23	2300	1016	Acid	0	0	0	0	37.5 units	71.5	89.1	1659	2129

All diabetics who have not an adequate knowledge of the dietetic treatment of their disease should be admitted to hospital in order that they may receive instruction in the preparation of their calculated and weighed diet—that they may learn the qualitative tests for sugar and acetone in the urine—that their carbohydrate tolerance may be accurately determined; and that the use of insulin, if required, may be safely instituted. Mild cases, especially if over fifty years of age can be controlled by diet. Cases that can not be adequately controlled by dietetic treatment alone should be given sufficient insulin to enable them to attain to a diet on which they may "carry on."

We wish to express our appreciation of the facilities placed at our disposal by the Honourable the Minister Dr. H. Beland, of the Department of Soldiers' Civil Re-Establishment, to Dr. W. C. Arnold, Director of Medical Services, D.S.C.R., and to Dr. S. R. D. Hewitt, Unit Medical Director, which enabled us to extend the treatment at an early date to ex-members of the Canadian Expeditionary Force, who were unfortunate enough to suffer from diabetes. Thanks are also due to Dr. C. McMane, the Dietitian Staff, and the Technicians at Christie Street Hospital, whose help has enabled us to carry on our work there successfully. Finally, we wish to thank the patients for their unfailing, cheerful co-operation, and faith in the treatment throughout the vicissitudes of the earlier experimental work on insulin.

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A Study of the Action of Calcium in Experimental Cocaine Poisoning.—From the experiments cited by Ira Frank, Jerome F. Strauss and William A. Smiley, Chicago, it appears that the action of calcium lactate and calcium chlorid is not directly antagonistic to that of cocaine. Convulsions occurred as quickly following the injection of cocaine, even though a large dose of calcium had been given previously. The rabbits did not survive a dose of cocaine appreciably larger than the lethal dose after the injection of either calcium preparation. When the cocaine and calcium solutions were mixed, there seemed to be a slightly increased tolerance for cocaine, but this may have been due to the greater dilution resulting from the mixture, thereby decreasing the rate of absorption. Briefly, then, the statement of Mayer that calcium acts antagonistically to the toxic effects of cocaine by overcoming the depression of the medullary centres caused by cocaine could not be confirmed by experiments on rabbits. The results obtained experimentally do not warrant the use of calcium lactate or calcium chloride as a therapeutic measure which can be relied on in acute cocaine poisoning.—*Journal A.M.A.*, June 30, 1923.

RECENT ADVANCES IN THE TREATMENT OF MYOCARDITIS AND NEPHRITIS

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MY duty to-day is to open the discussion on the treatment of chronic heart and chronic renal disease, and to deal more particularly with those phases of treatment which have been introduced into our *armamentarium* in recent years. It is more difficult than at first appears to define the word "advance." It is not synonymous with "new." The literature each year teems with therapeutic suggestions, most of which prove themselves in a very short period of time to be useless or even harmful, and it is desirable that they should be promptly scrapped. Again, it often happens that a therapeutic measure is not fully appreciated, although it may have been recognized as useful for many years by a few physicians. Such a measure, although not recent, is entitled to a place in this discussion. Before a remedy can be hailed as a true advance, it must pass the most rigid tests of clinical experience, and this may be a lengthy process. The advice of an Old Country professor, when he urged his students to be always two years behind the times, was sound and practical.

I shall endeavor to place before you certain forms of therapy which are of recent origin, or if not recent, at least require a fresh emphasis. With the assistance of those who will take part in the discussion, I shall endeavour to assess them at a value, which will enable us for the present at least, to advocate their use, or condemn them.

The measures which I consider entitled to consideration in this discussion are:—

Quinidine Sulphate.

The action of this drug in restoring the normal rhythm in auricular fibrillation is one of the most remarkable discoveries in therapeutics. Wenckebach, while treating a malarial patient with quinine, in 1914, discovered that a paroxysm of fibrillation ceased. In 1918, Frey published evidence that this action of quinine was probably quite correct, and found that quinidine sulphate, a derivative of quinine, was many times more potent than quinine itself, and was still more effective in restoring a normal rhythm in cases of auricular fibrillation. My attention was first called to this drug by an article in the *British Medical Journal*, of October, 1921, by Drury and Iliescu. They reported thirteen cases in six of which they were successful in obtaining a normal rhythm, and they reported no unfavourable effects. It is followed by an article in the same journal, by Sir Thomas Lewis, endorsing the value of the drug and offering an explanation of the manner in which it acted. In May, 1921, Levy wrote in the *Journal of the American Medical Association* reporting four cases. Since that time many references to the value of the drug have been made in the various medical journals. Up to the present, about 500 cases have been reported with about fifty per cent. of successes. A considerable number of cases relapse. The last article which I read was written by Drs. Oille and Jamieson, and published in the *Canadian Medical Journal*, May, 1923. It contains an interesting account of their experiences, and sums up the present status of the drug.

Sir Thomas Lewis in his article warned against the indiscriminate use of the drug. He wrote: "It is one which unless it is strictly controlled by frequent records of the auricular and ventricular action, is not without serious risk. The time will no doubt come when its use in general practice may be advocated, but it has not yet come." This was written less than two years ago, and the profession is waiting for a verdict from the larger clinical centres as to the safety of this drug, the remarkable action of which is indisputable.

My own experiences include five cases

Case I.—Male—Age 38.—Definite history of rheumatic fever. Was under my care in September, 1921, suffering from auricular fibrillation with definite heart failure, oedema, breathlessness, etc. Under treatment by rest and digitalis his symptoms of failure improved and he was able to leave the hospital without oedema, but with the auricles still fibrillating. In December of the same year, he returned to the hospital with another breakdown. After a short period of rest his oedema disappeared and I selected him as a suitable case for treatment with quinidine sulphate. I followed the same dosage as Drury and Iliescu, giving a preliminary dose of 0.2 gm., and six hours later a second dose of 0.2 gm. in order to test any increased sensitiveness of the patient to the drug. As no unpleasant symptoms occurred, I proceeded with the usual dose of 0.4 gm. three times a day. On the third day, after a total of 4.8 gms. had been given, the pulse was noted as regular, and the patient volunteered that he felt much better. At 6:00 and 11:00 p.m. the pulse was still regular, the rate 80, and the patient very comfortable. I was very much pleased with the result, but imagine the thrill which I experienced when on the following morning I was informed that my patient was dead. Death came so suddenly that neither nurse nor patients were aware of the exact time of its occurrence. I felt at the time that death was certainly not due to quinidine poisoning, as at least twelve hours had elapsed since the last dose. The only explanation of such a sudden termination was an embolus in the brain. The patient had no friends and we conformed to the rules of the Anatomy Act, handed the body over to Professor Cameron, and had, therefore, to wait some time for the *post mortem* proof of death. Several months later, when Dr. Cameron opened the cranium, his attention was attracted by a most putrid odour, the explanation of which was that the area of the brain supplied by the middle cerebral artery had received no embalming fluid and was in a state of decay, in striking contrast to the remainder of the brain, which was well preserved. Examination of the artery showed an embolus completely blocking the vessel. At about this time a case of embolism, with recovery, was reported in the *Journal of the American Medical Association*, by Wilson and Herrman, and in their case the embolus occurred some hours after the normal rhythm had been restored. The question now arises as to what part quinidine played in the fatal termination. It is well known that in cases of mitral stenosis, with or without fibrillation, thrombi form in the auricle and frequently separate and produce embolic phenomena, and there is no doubt that this is what happened in my case. It is not unreasonable to infer that the sudden restoration of normal auricular action was an important factor in the event, and the safety of this drug must be challenged. One cannot base an opinion on this point on one or two cases, as embolism is such a common complication of heart disease in cases untreated or cases treated by other methods. One would have to show that embolism was more common in the former than in the latter group, before condemning this remarkable drug as dangerous to the point of prohibiting its use.

Case II.—It was with some feelings of misgiving that I administered the drug to my second patient. I gave it on the same basis as the surgeon who assured his patient that there was absolutely no risk in the contemplated operation as the mortality was ninety per cent., and as the last nine cases had died, there was nothing else but recovery possible in the tenth case. In this second case, the patient was sixty, with chronic fibrillation on an arterio sclerotic basis. The result here was gratifying, as he had a normal rhythm in three days and no recurrence three months later.

Case III.—Failed to respond at all.

Case IV.—Was successful, and the rhythm became normal in two days. Three months later, the pulse was regular and patient free from the subjective sensations from which he suffered while the attack was on.

Case V.—The patient at first showed some idiosyncrasy to the drug, breathlessness and precordial distress being caused. Later, the drug was given without any unpleasant symptoms, and the treatment proceeded with along the usual lines. On the fifth day the pulse became suddenly regular after six grams had been given.

The diagnoses in my cases were made by simple clinical observations and confirmed by polygraphic tracings. My impression is that a general practitioner who can recognize fibrillation is competent to administer the drug if he observes the usual dosage and carefully selects his cases. It should only be given in cases which have not exhibited any evidence of recent embolism, who are free from definite signs of heart failure and who are suffering, or severely handicapped by the abnormal rhythm. I should like to refer to the common practice of using new remedies in a perfunctory manner, and in a way in which it was not intended that they should be used. All new remedies meet the same fate.

Not long after the publication of articles referred to, quinidine sulphate was advertised in a reputable journal in large letters for "auricular affections." It is hard to guess just what class of cases this expression might cover. You have heard the story of the up-to-date medical officer in the Army who labelled his case auricular fibrillation. In due time a letter came from the A.D.M.S., stating that his sergeant had looked through the official list of diseases of the ear and that disease was not included, and in future would he adhere strictly to the official nomenclature.

Administration of Digitalis

The claim of digitalis to a place in this discussion is not based so much on recent acquisitions to our knowledge of the drug, but rather on account of the wrong use by a large body of practitioners. We believe that the indications for digitalis are clearer to-day than formerly, although there is still room for improvement. The conclusions here outlined are based on clinical observations by many competent observers. It is a powerful drug and probably a two-edged sword, and should be given for specific purposes, rather than given as soon as a diagnosis of heart disease or heart disorder is made. That specific purpose is heart failure, which may be conveniently divided into two clinical groups. First, with a grossly irregular pulse, which is due in most cases to auricular fibrillation and can be recognized as such in ninety per cent. of cases without the assistance of the polygraph or electrocardiograph. It is in this group that digitalis exerts its most beneficial effects. In the second group of failure with a regular pulse it is not so certain that digitalis does good, and while a few are courageous enough to say that it is useless, the balance of medical opinion is still strongly in favour of its use. If we remove these two groups, we are left with a large number of cases of heart disease, some real and some fancied, and in such cases the administration of digitalis is quite uncalled for, and in small doses is nothing more than a placebo. The value of digitalis as a heart remedy is so well established in the lay mind that the psychic effect of small doses may be a practical but not a scientific reason for its use.

Graduated Exercises

While not new, the importance of exercise in heart disease was well emphasized during the War, and an excellent opportunity was afforded for observing its effects on a large scale. The practitioner can frequently help his cardiac patient by a carefully prescribed programme of exercise, consistent with the disability from which he suffers. This requires a high degree of individual judgment.

Pyschotherapy

This is a very important therapeutic measure in heart disease. It is still common to meet patients who have been told that they have serious heart disease because a systolic murmur, extrasystole, reduplicated sound, or tachycardia is present. The effect on the patient is depressing, and in some cases causes semi-invalidism. In such cases a careful examination followed by an opinion expressed with confidence and carrying conviction to the patient will dispel many symptoms referable to the heart, pain, breathlessness, palpitation, and make the patient a useful member of society. This applies to mild organic as well as functional or psychic disturbances.

Nephritis

Passing from the heart to the kidney, it might be said briefly that the recent advances in the treatment of renal disease are the outcome of our ability to test the functional efficiency of the kidneys. There is no doubt that these studies have placed the treatment of renal disease on a new and improved plane. Some of the methods are still too complex to be available for the great mass of sufferers from renal disease, but there are some tests which can be carried out without difficulty, and are of distinct advantage in treating renal disease. I shall stress three points only in regard to treatment.

High Protein Diet

There is no doubt that in the past many nephritics were subjected to a diet which was too low in protein and resulted in under nutrition. To Epstein is due the credit for emphasizing the value and the safety of a high protein diet in certain cases of renal disease. When it can be clearly demonstrated by renal function tests and blood chemistry observations that the kidney is eliminating nitrogenous waste products in a normal manner, although our older methods such as the estimation of the number of casts and the amount of albumin would point to a serious renal defect, it can be shown that a normal protein diet or even one higher than normal may have a distinct therapeutic value. It would, however, be bad practice to recommend a high protein diet in all cases. The clinical type which responds to a high protein diet is associated with marked oedema, ascites, a moderate or large amount of albumin, slight increase in blood pressure, and an absence of toxic symptoms. This type is called by some a nephrosis, by McLean a hydraemic type of chronic nephritis and corresponds well to what has been described for a long time as chronic parenchymatous nephritis. In this type salts and water only are retained, and while wherever possible a complete laboratory investigation should be made, it is, nevertheless, proper to rely on the clinical signs where laboratory assistance is not available. A careful observation of the clinical improvement in the patient will be of distinct value in deciding on the diet. The chief lesson that we learn is, that a protein diet is not such a dangerous factor in nephritics as we were taught to believe.

Urea in Renal Disease

The administration of urea in cases of oedema due to renal disease has been advocated by Professor Hugh McLean, of London, and seems to justify its use. Urea has long been known to have diuretic properties, and it is exceedingly interesting to learn that it may be used with benefit in cases of renal disease where we were led to believe that the accumulation of urea was an important factor in the production of symptoms. It should be used in the same class of case as the high protein diet. It is given as fifteen to thirty grams daily over a period of several weeks. In the one case in which I tried it, my patient refused to take it on account of the nauseating taste, but one of my colleagues has given me notes of a patient in which he used it with undoubted benefit. We shall watch this method of treatment with interest.

Focal Infections

An important point in the management of renal disease is to search for and eradicate any foci of infection. A disturbance of the kidney simulating acute nephritis is a well known feature in many septic conditions, and as a rule these cases clear up as soon as the original infection is under control. There can be no doubt that in chronic cases these foci play an important part, and it is highly proper that a complete survey of the various parts of the body which harbour foci of infection should be made and conditions dealt with as found. It was Osler who said that a man seldom died of the disease from which he was suffering, and this means that foci of infection may be responsible for acute exacerbations which may seriously increase the sufferer's disability, and in many cases may cause his death.

There are many other points which might be discussed in the treatment of chronic heart and chronic renal disease. I have selected a few which are relatively important and should serve as a basis for a discussion which will be profitable to the general practitioner upon whom rests the great responsibility of treating intelligently the majority of sufferers from these diseases. It is only a very small percentage of patients who can take advantage directly of the facilities available in the highly organized clinics, and the value of any remedy or remedies is comparatively small unless it can be utilized by the rank and file of the medical profession.

Roentgenograms of the Foetal Skeleton as a Positive Sign of Pregnancy.—Irving F. Stein and Robert A. Arens, Chicago, assert that in the second half of pregnancy, foetal roentgenograms are of definite confirmative value: (a) In recognizing clinically obscure presentations and positions, the roentgenogram clinches the diagnosis. (b) In differential diagnosis between pregnancy and other abdominal enlargements, the roentgen-ray evidence is the deciding factor. By pneumoperitoneum, the gravid uterus can be quite typically shown on the film in the early months of pregnancy. This may be considered a profitable sign. Its value in differential diagnosis is obvious. The demonstration of the foetal skeleton by the roentgen ray is the only positive sign of pregnancy possibly obtainable before quickening.—*Journal. A.M.A.*, July 7, 1923.

SOME EYE SYMPTOMS IN ENCEPHALITIS LETHARGICA*

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THE sudden appearance in 1916 of this disease in Vienna when Economo first described it, and its subsequent rapid spread or occurrence over most of the civilized world, is most striking. One is tempted to think that the roughly described lethargic diseases which occurred in the last and previous century may have been similar to this, the more accurate modern methods of investigation enabling us to isolate the disease as a morbid entity.

Pathologically, the anatomical lesions have been more or less exactly described, the infiltration of the brain tissue, and especially of the perivascular lymphatic sheaths of the smaller vessels with lymphocytes and plasma cells, proliferation of neuroglia and degeneration of ganglion cells, sometimes haemorrhages, also meninigitis. These changes being mainly in the pons and medulla and grey matter around the *iter*, but they may be much more widespread and also occur in the spinal cord.

As a result of these changes one can readily see how varying pressure can be exerted on the basal nuclei and supra and infra-nuclear nerve fibres or trunk, causing the varying paralytic phenomena observed in the eye.

Only lately the virus has been isolated; it certainly exists in the brain tissues, the cerebrospinal fluid and on the surface of the nasopharyngeal mucosa. The ocular symptoms of muscular paralysis, squint and diplopia, are most frequently the first trouble noted by the patient, and hence the ophthalmic surgeon is first applied to for help. These symptoms may be evanescent, so that they may have disappeared at the time when the patient pays his first visit, but the history of a past transient diplopia, together with drowsiness is of great value in aid of the diagnosis.

The third nerve, rarely the whole trunk but generally one or more of its branches especially those innervating the internal recti, is affected.

Ptosis is common, but in many cases I doubt if it is paralytic, but corresponds rather to the droop we find in the normally sleepy state, as, with an effort, the lid can be raised slowly. In monocular ptosis it would appear to be an effort to prevent the diplopia. Again the coordinated movements of both eyes up or down may be affected.

Lastly, as regards the treatment of the disease, it is a moot question. We are in the woods and can give no definite scientific method. The old sheet anchor, potassium iodide, can be employed.

I will report three cases which are rather typical and show interesting points.

Case I.—Mrs. L., age 28—August 9th, 1921, consulted me on account of double vision. In April she fell off a piano stool, striking her buttocks, since which time she had bad headaches over both sides of head, but especially behind the right eye, lasting four weeks, then disappearing. It recurred one week later with vomiting, which was not preceded by nausea. Double vision now developed, the right eye squinting outwards, and also intense sleepiness came on—the patient falling asleep at her work.

Examination showed:—Vision R.E. 6/6 accommodation good; no fundus change; pupils uneven but active to light and convergence. R. pupil 4 mm., L. pupil 3 mm.; accommodation normal; no limitation of the field of vision but well marked paralysis of R internal rectus 35° divergence.

August 25th, Dr. McKay reports Wassermann negative and diagnosis encephalitis lethargica. Dr. Percy Wright reports nose and sinuses normal. To-day, divergence 30° but paresis of superior and inferior recti has developed, although accommodation retained. These paralytic phenomena gradually disappeared.

On October 3rd, the eyes were normal, except pupils still unequal.

The interesting points are that here the eye symptoms were monocular; the occurrence of the vertical paralysis three weeks after the first paralysis of the internal rectus, and the fairly prolonged period of improvement; also there was no failure of accommodation, nor papilledema.

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*Read before the Eye, Ear, Nose and Throat Section at the Annual Meeting of the Canadian Medical Association, Montreal, June, 1923.

Dr. McKay found no other nervous lesion. Treatment was exhibition of the iodides.

The second case was:—Miss F., age 24; seen February 24th, 1922.—Came to me complaining of double vision lasting twenty-four hours. There was no headache, no nasal trouble, but uncontrollable sleepiness.

Examination.—Vision was 6/6 each eye. Accomodation normal; marked paralysis of right internal rectus; no fundal change; pupils even and active. One week later right side of lips felt numb and she thought taste was defective, but detected odours correctly. No temperature. Vomited several times, with nausea. Keeps eyes closed but it is not a true paralytic ptosis.

March 23rd.—Showed complete recovery. Treatment, Blaud pills and atropin. Four months later she had a temporary paralysis of right leg and foot which disappeared in six weeks.

In this case there is but little to note except the monocular limitation of the symptoms and the lack of any fundal change.

The third case was:—F. B. M., male, age 27.—Came to me January 18th, 1923, with a history of a long motor drive in a snow storm two days previously, after which he felt very dizzy. He took a purge, went to bed, and awoke next morning seeing double.

Examination.—The man appeared rather slow in mentition. Vision R.E. 6/6, L.E. 6/7, pupils even, active, and accommodation good. There was no fundal change except a possible congestion of left disc; semi ptosis. The muscle test showed 3° R. hyperphoria; 12° esophoria.

The double vision was marked at a distance, and was homonymous. With the fixation object held at the same distance, say fifteen to twenty feet, the separation between the two images remained constant all over the field, whereas at a distance of 20 cm. there was single vision. These symptoms are characteristic of paralysis of divergence. Coordinated movements to right or left are free.

The patient was admitted to the Royal Victoria Hospital, under Dr. Colin Russel, for the further study of his general nerve condition. Here he ran a temperature as high as 101° and lay in a drowsy, somnolent condition with eyes closed, but could be roused, although cerebration was delayed. Memory was good, and there were no delusions. Wassermann test negative. He was discharged February 3rd, mentally much brighter, still a little drowsy; diplopia gone; 3° esophoria at a distance; temperature normal.

He reported to me May 15th. Still slightly sleepy; has had several transient attacks of redness of left eye, with photophobia and free lachrymation—lasting four days. The accomodation is weak, the left upper eyelid droops and he noticed twice during the past two months that he could not turn the left eye downwards, there being marked diplopia. This lasted about a week. Contrary to strict injunctions he has been working while away, driving his motor.

This case is interesting from the fact that paralysis of divergence has been but rarely reported. This is possibly due to careless investigation as many cases of 6th nerve paralysis have been noted.

The chief differential diagnosis has to be from paralysis of both VI nerves and from spasm of convergence. From the former—the homonymous diplopia at a distance and not nearby, the unchanging space between images at a distance in all portions of the field, and the free movements of both eyes to the extreme right or left.

The diagnosis from spasm is still a moot point—but that master of eye musculature, Duane, holds that there is a distinct centre for divergence which, as these cases are sometimes followed by paralysis of one or both VI nerves, would point to the probable location of the centre. Again, cases of paralysis of the external rectus changing to paralysis of divergence have been reported. In spasm of convergence the deviation is more marked as the fixation object is brought nearer the eye.

His avoidance of complete rest, no doubt, had much to do with the persistence and recurrence of his symptoms, although it is characteristic of this disease to have recurrences of the symptoms, especially of the ocular paralysis, after nearly two years interval.

The prognosis, as far as we know, in regard to the eye phenomena, is good in the milder cases, but in acute cases running a high temperature for some weeks, the outlook is grave; deaths are far from infrequent.

Considering the nature of the pathological lesions, it can readily be seen how puzzling and manifold may be the symptoms for the neurologist to unravel, *e.g.*, in the early stages there may be no lethargy—then the evanescent nature of the symptoms. The ophthalmic surgeon may be, and is, of help in making the diagnosis.

In none of my cases, was I at all sure of defective convergence contraction of the pupil, which Holden asserts is characteristic of the sluggish pupil of encephalitis, but in the third case there was failing accommodation without dilation of pupil—this again suggesting the nuclear seat of the lesion.

Papilledema has been reported in a few cases, but was present in none of mine.

ACUTE OSTEO-MYELITIS

A. Mackenzie Forbes, M.D.

Surgeon to the Children's Memorial and Montreal General Hospitals

To Professor Clarence Starr and his associates is due the credit of having created a new interest in the subject of acute osteo-myelitis amongst the surgical profession of this continent. If every Canadian would but report his knowledge and observations of this condition, a new race of students would graduate who would be well able to make an early diagnosis, to treat surgically, and thus save the lives and limbs of those affected with what Starr has called "acute hematogenous osteomyelitis."

Not many years have passed since a branch of our profession claimed this condition as sacrosanct. But is the study of any cause of suffering, deformity and death to be relegated to any cult? Should not all unite to support every legitimate effort to study or to trace the etiology, pathology, diagnosis and treatment of disease?

In the Children's Memorial Hospital we look upon acute osteo-myelitis as one of the most important conditions to be studied, because the early recognition of this condition means so much to the patient, to his friends, and to the community.

Etiology.—This condition is probably secondary to an infection elsewhere. A superficial skin lesion, a *chronic infection of the tonsils or the ear*, or other similar condition may be the primary source of the infection. The commonest organism found is the staphylococcus aureus, where, according to Dr. D. E. Robertson, when this organism is responsible for the infection in the bone, the primary infection is generally in the skin. The next most common organisms responsible for this lesion are some strains of streptococci. Robertson holds that where the primary seat is in the tonsil, this organism is most likely to be the cause of the lesion in the bone. Pybus feels that in about thirty per cent. of the cases, the onset of this condition is preceded by injury. Robertson states that one should view with alarm the co-existence of infection and injury. It is wise to teach a sudden and unexplainable onset in this condition if our students are to be saved from confusing it with the onset of such conditions as acute rheumatic fever.

History and Morbid Anatomy.—It is stated that acute osteo-myelitis may be seen at *any age*. This does not seem to have been the experience of the Sick Children's Hospital in Toronto. According to Robertson it is believed that acute osteo-myelitis occurs only before the diaphysis is fused with the epiphysis. It certainly is most commonly seen between the ages of two and ten years.

This condition, in the majority, if not in all cases, starts in the diaphysis near the metaphysis. It commonly starts as an infection in the cancellous tissue near the cortex. By the third or fourth day, in classical cases, the infection has spread between the diaphysis and the epiphysis to reach the perisoteum, or the infective organism, (or perhaps the pus) has penetrated the cortex, and raised the periosteum, and appeared under this membrane. When the infection becomes subperiosteal it possibly spreads backwards through the Haversian canals of the bone not already infected, and invades the subcortical areas.

As the periosteum is raised, new bone is formed on this. This new bone is known as the involucrum. It is not usual for the infection to enter the medullary canal by extension upwards or downwards until after two to three weeks. It seems to be easier for it to reach the subperiosteal space by the Haversian canals or the para-epiphyseal line. Indeed, the distance of the medullary canal from the extremities of long bones, often as great as two or more inches, is an important anatomical fact, and is probably responsible for the time taken by pus to reach the medullary cavity.

When the infection reaches a subperiosteal position it tends to raise this membrane from the cortex in all directions, its only limitations being the attachments of this membrane. It is important to realize that the periosteum is attached to the extremities of the diaphysis, and is not continuous over the epiphysis, thus the joints are safe-guarded except where the synovial membrane extends over a diseased diaphysis. In this case the joint is subject to infection through contiguity. Sometimes the joint is infected by operation.

As the periosteum is elevated from the cortex new bone is formed on it. It is reported that this has been demonstrated by X-rays as early as one week from the date of the symptoms of an infection. Unfortunately, this is too late to be of any diagnostic value. The new bone is not continuous, but tends to be perforated in places These perforations are known as cloacae. Their number seems to depend on the rapidity with which the periosteum is detached from the cortex of the bone. The shaft of the bone, or parts of it, separated from the periosteum and lying under the newly formed bone, tend to die and form a sequestrum or sequestra.

The most frequent sites of acute osteo-myelitis are the upper end of the tibia, the lower end of the femur, the lower end of the tibia, and fibula, and the lower or upper end of the humerus. Then the upper end of the femur, the lower end of the radius, the ulna, the bones of the tarsus, the crest of the ilium, and the scapula.

Lesions in Other Organs.—Acute osteo-myelitis is a blood-borne infection. It must therefore, be primarily a bacteraemia. It may become a septicaemia with organisms *growing* in the blood, or it may become localized in one or more joints.

If drainage is not secured early an acute osteomyelitis tends to become a septicaemia. In this case there may be infection of other joints, as well as the heart and other organs.

Symptoms.—Speaking generally, acute osteomyelitis is characterized by certain symptoms which appear in a fairly definite sequence.

The first and second symptoms:—pain and tenderness.

The first and most important *subjective* symptom is constant and increasing *pain.* D. E. Robertson says that if the disease be in the lower limbs, the pain during the first few hours is not necessarily so severe as to prevent walking. It will, however, produce a limp, and for this reason may be considered as only a strain. In six to eight hours it is severe, and is complained of as being in a joint. It is constantly increasing, so that before twenty-four hours have elapsed, sleep is difficult or impossible.

The first and most important *objective* symptom is *tenderness.* This is to be elicited just above or just below a joint. In the early stages it is quite restricted. It spreads, however, as the infection increases.

The third symptom—*constitutiona' reaction.*

The third symptom in order of incidence is the constitutional effect of the invasion. These effects may be noted often not later than six to eight hours from the very first suggestion of pain. Indeed, sometimes constitutional symptoms may appear even earlier than six to eight hours from the incidence of pain, the initial, and yet a subjective symptom. Constitutional symptoms are often very marked, and may first be shown as chills, nausea, and vomiting, with high temperature.

The fourth symptom—*leucocytosis.*

The fourth symptom is a leucocytosis, but unfortunately this is seen in so many acute conditions that, while it points to an infection, it does not help to differentiate an osteo-myelitis from any other acute condition.

In this way the first twenty-four hours pass; the symptoms becoming increasingly marked. Quoting D. E. Robertson again: "The pain maintains its constant character, and sleep becomes impossible." The affected part is guarded from movement. There are marked symptoms of intoxication.

The fifth symptom—*swelling and redness.*

In twenty-four to thirty-six hours from the first onset of the pain a fifth symptom appears—swelling and redness. Swelling is not marked at first, although it soon increases in extent. Redness is often no greater than a slight blush, but it also will increase with greater involvement of the superficial tissues. Both of these symptoms are first noticed just above or just below a joint. In the cases of an infection of the small bones of the foot, or the neck of the femur the symptom swelling may be found in positions more or less remotely associated with the exac seat of the infected bone. Thus, in infection of the astragalus the swelling is commonly on the dorsum of the foot. In infection of the os calcis the swelling may be under either or both malleoli. In infection of the neck of the femur swelling may appear over the great trochanter, or along the crest of the ilium.

As a general rule swelling first appears in a position exactly over the area which was first found to be tender. It soon spreads in directions especially away from the proximal joint, although this later may become swollen through an extension of the infection by paths already described, or perhaps the proximal joint may become swollen by mechanical interference with the circulation.

While I have described above the classical picture of a case of osteo-myelitis, others have gone further, and subdivided osteo-myelitis into distinct types. According to Fitzwilliams, of these there are three:

Type 1.—In this the patient suffers from malaise, vomiting, with gradually increasing temperature and pain.

Type 2.—This is the more classical form. Here we have rigors and exquisite pain.

Type 3.—Of all types perhaps this is the most important because it is the most likely to be overlooked. Here our patient, while complaining of nothing in particular, suddenly seems to become overwhelmed with toxines resembling—indeed—some of the worst cases of diphtheria or typhoid fever. In these it may be most difficult to find a cause for the patient's prostration.

Prognosis.—The prognosis is always grave. It depends on an early diagnosis, on the resistance of the patient, and the virulence of the organism causing it.

Acute osteo-myelitis is a blood-borne infection. It must primarily be a bacteraemia. The organisms at one time floated freely in the blood. Theoretically this condition may be speedily followed by a septicaemia with organisms growing in the blood. In the cases under consideration it becomes localized as an acute osteo-myelitis. It has been the experience of the Sick Children's Hospital, in Toronto, that positive blood cultures may be made in practically all cases of acute osteo-myelitis. When these cultures show that the organism is a staphylococcus the local symptoms in the bones will be more destructive than if it is due to a streptococcus, although the latter is more likely to be accompanied by greater constitutional effects.

In acute osteo-myelitis symptoms of septicaemia are often found early, then the prognosis is indeed grave. I cannot say that a superadded septicaemia is invariably fatal, although in my experience it has always been so. A profound toxaemia may precede the diagnosis, and be responsible for a fatal result.

Diagnosis.—One of our prominent surgeons has stated that this condition can *only* be confused with a cellulitis, but he speaks of cases which are well advanced. Pybus has suggested that it should be diagnosed from sprain, acute rheumatic fever, acute infective arthritis, and from cellulitis.

From sprain it is diagnosed by the lack of fever in that condition, by the fact that in sprain it is the joint which is first affected.

In rheumatic fever there is early swelling of the joint. In early cases of acute osteo-myelitis the contour of the joint is absolutely normal, although it may be held in flexion by muscular spasm. Soon there is a sinovitis in other joints, and lastly, the salicylates will early influence the symptoms of an acute rheumatic condition.

It is often difficult to differentiate between an acute infection of a joint and an acute infection of bone separated from that joint only by the thin epiphysis. It is especially difficult in infants, who are subject, as you know, to the pyogenic arthritides secondary to umbilical and respiratory infections. Here, to make a diagnosis, we may have to explore. Indeed, we are justified and called upon to explore to make a diagnosis and to secure drainage.

It is much the same in making a diagnosis between cellulitis and acute osteo-myelitis. In both cases incision is not contraindicated, or at least, not to be condemned. A cellulitis may be secondary to an acute osteo-myelitis. It is wiser to make a diagnosis of acute osteo-myelitis and find, to our joy, that the patient suffers only from a superficial lesion, than to make the mistake of localizing our infection in the superficial tissues when it is imperative that a contiguous bone abscess should be drained.

Treatment.—Let us immediately relieve tension. As soon as a diagnosis is made we should cut towards the bone. If three to four days have elapsed since the onset, pus will be found beneath the periosteum. Many say that we may go no further if this condition obtains, but personally I am inclined to adopt Clarence Starr's suggestion and to drill through the bone in order to secure greater drainage of the subcortical tissues. If pus be not found beneath the periosteum, we should anticipate its collection there by drilling towards the probable seat of the infection through the cortex into the subcortical layers of the diaphysis near the metaphysis. I believe in creating an area of least resistance by drilling four or six canals through the cortex in the direction stated. This seems to be the practice of Starr, and should be followed.

It is not necessary to chisel into the medulla in the early days of this infection, because in classical cases it takes two to three weeks for the infection to reach that cavity.

THE EARLY DIAGNOSIS AND TREATMENT OF NEUROSYPHILIS*

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In reporting a few representative cases of neurosyphilis from a series seen in private practice, it may be timely to pass briefly in review the importance of the early recognition of the involvement of the nervous system and the present consensus of leading medical opinion as to its treatment.

Until more recent years it had long been a common custom among medical men to consider the absence of neurological signs and symptoms as tantamount to the absence of infection of the central nervous system. The fact that late neurosyphilis, of both vascular and parenchymatous types, was steadily presenting itself for treatment, was explained as a sudden outward expression of a latent infection—not realizing that it was due to inadequate early treatment. During the past few years especially there have been reported in the medical press numerous excellent studies of the many-sided aspects of this most interesting and far-reaching subject of neurosyphilis, and among these studies none have been so interesting or important as those which prove the very early involvement of the central nervous system, and call attention to the paramount necessity of a lumbar puncture and spinal fluid examination early in every case of syphilis. Eberson, as well as Brown and Pearce, have proven very conclusively that in animals, wide dissemination of the spirochaetae occur even before a local sore has appeared at the site of infection, and demonstrated spirochaetae in the spinal fluid eight days after inoculation. Maitland, in a paper, recently reports some exceedingly interesting observations carried on by him in association with Fildes and Parnell in the routine examination of 1,314 unselected cases of syphilis (without obvious neurological involvement). Of these, 28% showed abnormal spinal fluids. Of 1,027 of the cases whose infection was within eighteen months, 25% showed abnormal fluids. Wile and Hasley, in 221 cases in the primary stage—before the roseola appeared—found 22% with abnormal fluids. Fordyce gives the spinal fluid involvement in secondary stages as between 25 and 30%. Many other observers have submitted similar findings. It is, of course, admitted that not all such early cases proceed to serious meningeal, vascular or parenchymatous damage, but certain it is that many of them do; and especially is this the case among the inadequately treated.

Southard and Solomon have for years urged the importance of a routine examination of the spinal fluid in all cases of syphilis, but in this regard we probably owe more to Fordyce, since his appeal has been more to those in the practice of general medicine. In numerous communications based upon a vast fund of clinical and laboratory data, he has supplied us with vital information as to the importance of the early recognition of neurosyphilis. Workers generally are agreed as to the importance of lumbar puncture and a careful examination of the cerebrospinal fluid in every case of syphilis. Frothingham instances two cases of syphilis with positive blood Wassermann reactions being under observation in a hospital some years ago. The fluid was not examined, as there were no neurological signs, and later they both returned with frank tabes. A persistently positive Wassermann in the blood in spite of long treatment should always suggest a lumbar puncture. Stokes warns not to perform this puncture until a few injections have been given to prevent carrying blood infection into the fluid and thus infect the meninges.

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*Read before the Ontario Medical Association, Toronto, May, 1922.

Fordyce* gives a very interesting chart based on the examination of 5,000 cerebrospinal fluids, showing the tests which an examination of the cerebrospinal fluid presupposes, and the various probabilities in the different forms of neurosyphilis. In addition, there are cases of syphilitic involvement of the central nervous system which yield negative tests. Solomon and Klauder point out this fact clearly in a recent article in which they specify vascular neurosyphilis, which includes thromboses, haemorrhage, cerebral aneurysm and arteritis obliterans; also tabes, cerebral gumma, cerebral syphilis causing cerebral nerve palsies, Erb's syphilitic spastic paraplegia, syphilitic epilepsy, syphilitic paranoia, and syphilitic dementia. The blood Wassermann in these cases may or may not be positive. The Argyll-Robertson pupil is the chief sign of dependence; other pupillary abnormalities less so, and especially when associated with other neurological symptoms.

The consensus of opinion favours the view that as a rule neurological signs and symptoms of syphilitic involvement are preceded for years by changes in the spinal fluid. As Fordyce says, "The nervous system may lodge the spirochaetae for years, with little or no tissue reaction, until a traumatism or some exciting factor stimulates their activity, or until sufficient time has elapsed to permit centres or tracts to be compromised which may give rise to objective signs or symptoms." The spontaneous disappearance of these changes is also admitted. Active progressive symptoms of the type of tabes or nerve palsies may subside and the fluid return to normal by this spontaneous remission or cure. "Burnt out" tabes is an appellation ascribed when the fluid is normal though objective symptoms persist. Solomon has even shown the collodial gold reaction to vary in fluid taken from various levels in the same case, *e.g.*, the ventricle, the cisterna magna, base of the brain and the lumbar sac. He also showed that a provocative arsphenamine may convert a negative into a positive spinal fluid. Failure to utilize the spinal fluid examination of every case of syphilis early, will certainly lead to many cases progressing slowly or rapidly into neurosyphilitics.

Pleocytosis or increase of the cells in the spinal fluid is the earliest of these phenomena indicative of syphilis. While not of itself pathognomonic of syphilis, it is probably safer to regard it as an evidence of syphilis of the meninges and treat it accordingly, than to disregard it. The increase of globulin comes next, and the Wassermann reaction in the fluid last. Stokes claims that a normal fluid early in the secondary period tends to show an immunity to later infection, especially if effective general treatment is carried on. Moore, however, reports two cases out of fifty-four reexamined, where an early negative fluid became positive in spite of vigorous general treatment.

The tests then required of every spinal fluid are: the cell count, the globulin reaction, the Wassermann reaction, and the colloïdal gold test of Lange. Of this last, Fordyce says, "We have used this test for six years and consider it of great diagnostic and prognostic value."

The full discussion of the various methods of treatment of neurosyphilis is not the object of this paper. My own experience in this matter is limited to the intensive treatment by some form of the newer arsenicals intravenously, combined with mercury and iodide in some definite plan, or in these measures, plus the Swift-Ellis intraspinous treatment fortified at times with a small dose of the drug added to the serum at the time of injection. I think the majority of men treating neurosyphilis adhere to this routine very largely at least.

In 1920, Dercum introduced the method of spinal drainage whereby considerable amounts of spinal fluid were removed at regular intervals. He also claimed that any benefit accruing from intraspinal therapy was due to the drainage incidental to it, thereby causing increased pressure in the vessels of the nervous system, which in turn results in a hyperaemic condition. He compares it as a parallel to the Bier method in surgery, replacing the old fluid by new, thus causing lavage of the subdural space. Stokes very aptly remarks that "therapeutists of our acquaintance, who are getting good results, make a practice of introducing as much or more serum than the amount of fluid withdrawn and hence reduced hydrostatic pressure does not apply." Boudreau, in a recent review of the subject, says, "he (Dercum) lays no claim to experimental evidence but reasons from an analogy of other

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Intraspinous Therapy in Neurosyphilis, J. A. Fordyce, *American Journal of Syphilis*, Vol. 3, No. 3, July 19th, 1919, page 344.

known facts in other tissues; and, furthermore, the theory is not in accord with Halliburton. The method causes great pain, which seldom occurs if the fluid is replaced by serum." Indeed Fordyce, the most redoubtable exponent of the Swift-Ellis method, no longer removes any fluid. He says, "As a result of experience I have long since ceased to drain the spinal fluid preliminary to the introduction of the serum. The latter is introduced under pressure and more fluid is present in the subarachnoid space than normal. My clinical and serological results have been vastly better since the incidental drainage has been discontinued."

With regard to the details of treatment; the technique has been so frequently described in the literature that it needs but a passing reference,—the injection intravenously of the diarsenol, the withdrawal from one-half to one hour later of 50 cc. of blood, and the reinjection next day or later the same day of a part or all of the inactivated serum obtained from the patient. This may be with or without the addition of 1.10 to + mgm. of diarsenol, and with or without the removal of a similar amount of spinal fluid. The serum should be well diluted by allowing considerable fluid to drain out into the serum container, thus also securing a much wider immediate distribution of the serum and drug.

In my own limited experience of some 200 intraspinal injections for this disease there have been less unpleasant after-effects than in doing lumbar puncture for diagnostic purposes. More pain has resulted in some patients from mercurialized serum. Someone has offered a plausible explanation of the subsequent headache of diagnostic lumbar puncture by ascribing it to the continued drainage of the fluid through the dural opening into the extradural spaces, thereby occasioning a much greater loss than apparent. To obviate this it has been suggested to have the patient lie prone on his face with the foot of the bed elevated until the needle opening has become closed.

My own series of cases is not sufficiently large upon which to generalize. May I call your attention in this connection to a series of 231 cases reported by Dr. Frothingham. He emphasizes the difficulty pointed out by Southard and Solomon of deciding the type of lesion present in the central nervous system of an individual case. He classified his cases as:

Type	*Number*	*Blood WaR Pos.*	*Blood WaR Neg.*	*Not reported*
Tabes	121	75	40	6
Cerebrospinal syphilis	56	38	15	5
General paresis	45	37	7	1
Meningeal syphilis	9	8	1	0
	231			

With regard to the results of treatment, the cases resolve themselves into two groups—the rather unsatisfactory (of tabes and paresis), and the satisfactory (of syphilitic meningitis, cerebrospinal syphilis, etc.). Or, as Fordyce says, "We have, on the one hand, superficial types rapidly curable, and, on the other hand, deeper ones which yield only to prolonged treatment. In their therapeutic response and fluid formula the latter are probably of the preparetic type, which, without treatment, would eventually result in degenerative encephalitis." And further, to quote Southard, "No one can now successfully make a differential diagnosis between the paretic and the diffuse non-paretic forms of neurosyphilis in many phases of either disease, even with all laboratory refinements. Hence, it is improper not to give the full benefits of modern treatment to all cases in which the diagnosis remains doubtful, between the paretic and diffuse non-paretic forms of neurosyphilis. It is unfair to give an entirely grave prognosis in any case of neurosyphilis until the effect of treatment has been tried."

With regard to the ultimate cure, Farquhar Buzzard points out the danger of depending upon a negative Wassermann reaction and prefers to view these cases as we view cases of tuberculosis,—as "cures" with the germ always present but in a dormant or latent state, and that only constant vigilance and periodic treatment can ever effectually control the infection. The very remarkable findings of Warthin confirm this view of its tendency to incite at times very little reaction to its presence.

Note.—Owing to limitation of space, several tables shown as lantern slides with this article had to be eliminated, and the others very much abridged.

CEREBROSPINAL SYPHILIS

R. A. R. A.—Age 34—*Primary sore*, October, 1921. Accident in treatment caused slough at site of inoculation; discharge for months. Two intramuscular injections of mercury. Two negative Wassermanns up to December 31st, 1921. February 1st, 1922, developed pain in lower extremities and stiffness of right side of face. About March 1st, slight weakness developed in lower extremities, gradually increased with numbness. *Saw him first, April 1st, 1922*, with marked weakness of left leg and less of right. K.J. both exaggerated. No clonus. Right eyelid heavy, otherwise eyes normal Within another forty-eight hours left leg was completely paralyzed, the right almost so, numbness up to rib margin, complete loss of bladder and rectum control.

	CEREBROSPINAL FLUID				*Blood serum*
Date	*Cells*	*Glob.*	*WaR.*	*Colloidal Gold*	*WaR.*
April 5, 1922	162	4+	4+	23444433100	4+
to					
May 26, 1922	25	2+	4+	23444321000	4+

Treatments.—April 5th, 1922, to May 26th, 1922:
4 intravenous injections of diarsenol;
4 intraspinal injections of diarsenolized serum (Swift-Ellis).

Results.—Within five days of his first treatment, some muscular power was returning in both legs, as well as sensation. Within two weeks he was able to walk a little; now he walks almost without a limp. Still slight feeling of numbness in lower left extremity.

CEREBROSPINAL SYPHILIS

H. P.—Age 35.—Chancre in September, 1920, lasting six weeks. Diagnosed as lues and given four injections of diarsenol (1 intravenous, 3 intramuscular), and 9 intramuscular injections of mercury. Blood WaR., reported negative, January 10th, 1921. February 15th, 1921, developed severe *headache* and aching eyes. March 1st, 1921, began to have *diplopia*. Dr. J. M. McCallum found optic nerve involvement. Pupils react to light. K.J., present No Rombergism. Coordination normal. No mental symptoms. Referred by Dr. J. G. Caven.

	CEREBROSPINAL FLUID				*Blood serum*
Date	*Cells*	*Glob.*	*WaR.*	*Colloidal Gold*	*WaR.*
Mar. 30, 1921	1340	4+	4+	44554321100	4+
to					
Apr. 29, 1922.	10	–	3+	01122210000	–

Treatments.—March 30th, 1921, to April 29th, 1922:
23 intravenous injections diarsenol;
23 intraspinal injections diarsenolized serum fortified with 0.1 to 0.5 mgms. as well as mercury and iodide by mouth.

Results.—Cure of diplopia. Fundus almost normal. This case illustrates the very bad results which occur sometimes through neglect to perform lumbar puncture. Had this been done early, this patient might have been saved months of idleness, as the diplopia was so marked that he had to cease work.

CEREBROSPINAL SYPHILIS

F. D.—Age 33.—Entered St. Michael's Hospital, May 1915. While lifting a machine developed a lame back. Gradual weakness of lower extremities and within a week paraplegia, loss of bladder and rectal control with almost complete loss of sensation, below umbilicus.

	CEREBROSPINAL FLUID		*Blood serum*	
Date	*Cells*	*Globulin*	*WaR.*	*WaR.*
May 15, 1915......	550	4+	4+	4+
to				
Nov. 5, 1915.......	12	±	±	+

Treatment.—May 15, 1915, to November 5, 1915:
16 intravenous injections salvarsan;
12 intraspinal injections salvarsanized serum (Swift-Ellis).
grey powder and potassium iodide and some rubs.

Results.—By August 1st, had regained complete control of legs, bladder and rectum, and sensation was almost normal. Acted as an orderly from September to November. No treatment since. Last heard of one year ago, apparently perfectly well.

TABES

J. M.—Age 30.—5′-9½″, 147 lbs.—Weakness and *pain in the lower limbs* began one year ago. March, 1921, *collapsed* while at work, being unconscious for some minutes. Has had uncertainty of gait for the past six months. Transient *diplopia* a couple of times in the past two months. Slowness of urinating and weakened sexually lately.

Had chancre at 19, treated by local powder for two months. Saw no secondaries. Now slight Rombergism. Coordination of both extremities slightly impaired. Pupils small, react sluggishly, right one asymmetrical. K.J. absent. Superficial reflexes normal. Sensation of lower extremities slightly impaired.

	CEREBROSPINAL FLUID				*Blood serum*
Date	*Cells*	*Glob.*	*WaR.*	*Collodial Gold*	*WaR.*
June 9, 1921..	135	4+	4+	34444433100	4+
to					
May 19, 1922.	24	1+	4+	12334332100	..

(After a treatment on June 17th, 1921, he felt miserable and ran a temperature up to 100°F. for several days. He had come over on the boat the day before the treatment and had contracted a cold, to which I ascribed his temperature. However, by June 26th, 1921, he began to show some jaundice of skin and sclera, and had marked reaction for bile in the urine, although he was feeling much better. On account of this jaundice I discontinued the diarsenol. One month later began mercury and iodide by mouth. By October 8th, 1921, his general condition had improved greatly, although his reactions were unchanged. Bladder control better and legs much more stable. Commenced mercurialized serum intraspinously.)

Treatment.—June 9th, 1921, to May 19th, 1922:
2 intravenous injections of sodium diarsenol (0.3 and 0.5 gm.).
2 intraspinous injections of diarsenolized serum (Swift-Ellis).
10 intraspinous injections of mercurialized serum. (mercury and iodide by mouth).

Results.—On March 23rd, 1922, had typical epileptic convulsion while under full treatment, as above. Has been feeling much better since January 1st, 1922, and able to continue at his work. Eyes and reflexes unchanged.

TABES

S. C.—Age 52.—Infection in 1890, followed by rash and sore throat. Some mercury rubs. Went to Hot Springs where they said it was not syphilitic. No signs or symptoms until 1918, when poor eyesight caused him to consult a doctor. Blood WaR. 4 plus. Spinal fluid reported as positive; no further details. K.J. very sluggish. Both pupils small and slight inequality; both Argyll-Robertson. Coordination of arms and hands fair. No Rombergism, but legs tire easily.

	CEREBROSPINAL FLUID				*Blood serum*
Date	*Cells*	*Glob.*	*WaR.*	*Colloidal Gold*	*WaR.*
Mar. 1st, 1919	90	4+	4+	......	4+
to					
Feb. 11, 1921.	15	–	2+	12233443200	..

Treatment.—March 1st, 1919, to February 11th, 1921:
25 intravenous injections diarsenol.
17 intraspinal injections diarsenolized serum (Swift-Ellis).
(Some fortified with 0.1 to 0.5 mgms.).
(Some mercury with chalk).

Results.—Coordination very good in both extremities. Plays golf regularly and feels fine. Has much better control and less fatigue of lower extremities. Pupils much the same. Difficult to keep at treatment as he feels so well.

PREPARESIS OR GENERAL PARESIS

H. B. N.—Age 50.—Treated for the past three years as a neurasthenic; failing memory, lately, with jumbled writing; carelessness in appearance; apprehension and markedly melancholy. K.J. sluggish to absent. Pupils do not react to light. Rombergism slight. Sensation unimpaired. Denies infection but admits exposure many years ago.

	Cerebrospinal Fluid				*Blood serum*
Date	*Cells*	*Glob.*	*WaR.*	*Colloidal Gold.*	*WaR.*
Oct. 26, 1920.	315	4+	4+	......	4+
to					
Aug. 3, 1921.	46	2+	3+	11234432000	4+

Treatment.—October 26th, 1920 to August 3rd, 1921:
7 intravenous injections of diarsenol;
7 intraspinal injections of diarsenolized serum (Swift-Ellis).
(Fortified by 0.1 to 0.5 mgm.).
(Some mercury and potassium iodide by mouth).

Results.—There was very marked improvement by Christmas, 1920, when he discontinued treatment. By February, 1921, he had gained 35 pounds in weight, could write and calculate accurately, and seemed to be mentally normal. No longer depressed. In April, his friends decided to let him take one more treatment and then stop. By July a marked relapse had set in, and he became in a worse condition than formerly, with grandiose ideas of a very marked nature.

GENERAL PARESIS

H. B.—Age 38.—Saw him first, June 20th, 1920, having fallen out of bed while in a seizure or fit. Slowness in urinating, gradually for one year previously. Difficulty in climbing stairs for the same time. Gradual change of whole mental make-up, with peculiar shyness, and at times grandiose ideas. Judgment markedly impaired. K.J. absent. Pupils fixed, unequal and asymmetrical. Rombergism marked. Gait ataxic.

	Cerebrospinal Fluid				*Blood serum*
Date	*Cells*	*Glob.*	*WaR.*	*Colloidal Gold*	*WaR.*
June 28, 1920.	168	4+	4+	......	4+
to					
May 30, 1921.	41	2+	4+	23444321000	4+

Treatment.—June 28th, 1920, to May 30th, 1921:
6 intravenous injections of diarsenol;
6 intraspinal injections of diarsenolized serum (Swift-Ellis).
(Fortified by 0.1 to 0.5 mgm.).
(Some mercury and potassium iodide by mouth).

Results.—By October, 1920, had improved so much that his friends thought he was all right, and he felt so well himself that he decided further treatment was unnecessary. Mental condition was normal. By December, 1920, grandiose ideas began to return, and judgment again became defective. After treatment in December he improved again, and again they stopped treatment. In May, 1921, legs became more troublesome and he had a severe convulsion, being unconscious for six hours. Friends felt that they had done all they could for him and that he would have to go to an institution.

TABES

J. P. W.—Age 42.—Barrister. At age 21 had a *soft chancre.* Local treatment only. At 32 began to have pains in the arms and legs—worse at night, along with slow micturition. At age 37 had stiffness of knees and had a "nervous breakdown." Condition diagnosed and put on iodide. At 38 given neosalvarsan, one dose having a remarkable effect in the way of improvement. During that year he received four additional doses of salvarsan intravenously, and minute doses of salvarsan intraspinously, which improved him greatly. Has had one dose of combined treatment each year since.

K.J. absent. Pupils react slowly to light. Superficial reflexes present. Rombergism marked. Coordination of lower extremities very poor.

	Cerebrospinal Fluid			*Blood serum*
Date	*Cells*	*Globulin*	*WaR.*	*WaR.*
June 22, 1917......	20	4+	4+	3+
to				
April 20, 1919.....	15	2+	3+	3+

Treatment.—June 22nd, 1917, to April 20th, 1919:
6 intravenous injections of diarsenol;
4 intraspinal injections of mercurialized serum.
(mercury and iodide by mouth).

Results.—He had improved so much, and being a busy barrister and solicitor in a small city, and perfectly able to carry on his work and get about freely with the aid of a cane, he discontinued treatment. I hear from him at intervals that he is feeling very well.

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A CITRATE METHOD OF BLOOD TRANSFUSION DEVISED TO MINIMIZE POST-TRANSFUSION REACTIONS

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THE purpose of this paper is to describe (*a*) a citrated-blood transfusion apparatus that is simple in structure and adapted for use under most conditions; and (*b*) a technique of citrate blood transfusion which, in a series of fifteen most variable cases, has produced no post-transfusion reaction whatsoever.

Much has appeared in the literature in the last two or three years as to the best methods of blood transfusion. The direct method or arteriovenous anastomosis devised by Crile, did much to stimulate the technique of this valuable procedure; but, because of its highly surgical technical nature and the important fact that no method has been devised for determining the amount of blood transfused, it has been superseded practically completely by indirect methods.

Since Lindeman, in 1913, first introduced his syringe and needle method, the indirect technique method has become rapidly popularized and numerous modifications of various types were soon introduced. Of particular interest are the methods devised by Unger, Kimpton, Percy and Bernheim. While these methods were still in their infancy, Lewisohn, Agote and others were experimenting with the use of anticoagulants and after very careful animal experimentation showed that sodium citrate, which had hitherto been considered too toxic for human administration, could be given with perfect safety in a concentration of 0.2%, a strength sufficient to withhold coagulation for hours.

At the present time there are those who strongly maintain that the most satisfactory and most logical method is an indirect procedure without the use of anticoagulants. While this method may be most desired in that no foreign substance is added to the blood, still, its great disadvantage lies in the fact that for its satisfactory conduct and the bringing of the transfusion to a successful issue, one has to depend upon expert team work and usually upon up-to-date hospital facilities.

Dissatisfaction with the citrate method has resulted largely from the reactions that have been noticed following in the wake of the transfusion. These reactions which occur usually about fifteen minutes after the completion of the operation are ushered in with a chill, often culminating in a rigor, rise of temperature to 102 or 103 degrees, increase of pulse rate and occasionally vomiting. These reactions, which are very distressing to the patient, last from fifteen to twenty minutes and are followed by free perspiration and a rapid cessation of symptoms. Fortunately these symptoms, although striking, are apparently not disastrous, are not associated with any blood destruction as would be evident by haemoglobinuria, and do not interfere with the value of the transfused blood.

These reactions have been generally explained heretofore as resulting from the toxic action of sodium citrate. In a recent article, however, by Lewisohn, these reactions are described as occurring practically as frequently in non-citrate as in citrate methods. They are not looked for in every case of citrated-blood transfusion and when they do occur may vary from a mild chill to a very severe reaction. This marked variability in the clinical picture is suggestive at least, that these post-transfusion phenomena are not solely dependent upon the poisonous effects of sodium citrate. In many of the methods described for conducting the citrate method, particularly where gravity is depended upon for transfusing the blood, one cannot help but be struck with the observation that the blood receives much more manipulation, comes in contact with more foreign bodies, is more freely mixed with air, has a greater chance of becoming cool and is more liable to bacterial contamination, than it does in any of the other methods where no anticoagulant is used. In an attempt to preserve the advantages of the citrate method and to minimize its disadvantages, the apparatus herein described, was constructed.

Description of Apparatus

The apparatus as illustrated in Fig. 1 consists of two large mouth bottles of uniform size with capacity of approximately one litre each. One bottle (*A*) is graduated in 100 c.c., and is for (*a*) collecting the blood from the donor, and (*b*) holding the blood while it is being injected into the recipient; for this bottle are provided two rubber stoppers; the first, (Fig. 2, No. 1) is for collecting the blood from the donor; the other, (Fig. 1, No. 2) is for delivering the blood during the operation of transfusion. The second bottle (*B*) is provided with only one rubber stopper; this is fitted with glass tubing for delivering saline solution. Bottles *A* and *B*, by means of a minimum amount of small thick rubber tubing, are united through a Y-shaped glass tube to a three way glass stop-cock. By manipulating the stop-cock the contents of bottles, *A* or *B*, can be drawn into the syringe by adjusting the artery clamps which control the flow from either bottle; and then by turning the stop-cock the contents of the syringe may be passed through tube "C" to the recipient. Tube "C" is about fifteen inches in length and carries in its distal end an adaptor which fits the Luer needle (*D*) which, during the transfusion, is inserted into the vein of the recipient.

The Transfusion

It is essential to have available 500 c.c. of normal saline solution: preferably just prepared from fresh redistilled water. Of this freshly prepared saline solution, 50 c.c. is used in preparing 50 c.c. of a 2% solution of sodium citrate. Both the saline and the citrate solutions are then sterilized by autoclaving or by boiling if an autoclave is not at hand.

The apparatus, after being sterilized by boiling, is put together as shown in Fig. 1. It is necessary to have a table four feet in length to hold the outfit satisfactorily. In private dwellings an ironing board set between two chairs, or a piano bench act admirably. The sterile normal saline is placed in bottle *B* and kept at body temperature in a basin of warm water large enough to hold both bottles. By means of an artery clamp the tube running from bottle *A*, which later will contain the blood, is clamped off, and, by using the syringe and three-way stop-cock the rest of the apparatus is filled from bottle *B* with saline, and all air bubbles removed. In order to fill the tube coming from bottle *A*, the syringe is again filled with saline and the tube from bottle *B* clamped. By releasing the artery clamp on the tube from bottle *A*, this tube is filled with saline from the syringe and the clamp again applied.

At this stage of the technique a tourniquet is applied to the arm of the recipient, a vein selected and the skin made surgically sterile with iodine and alcohol. A local anaesthetic is injected beneath the skin over the vein, a small incision about ½ inch in length is made and the vein isolated. It is then elevated on a grooved director, moistened with saline and covered with sterile gauze. If one has a capable medical assistant, time can be saved by having him isolate the vein while the blood from the donor is being obtained. In some instances when the vein of the recipient can be made at all prominent, there is no necessity for cutting down on

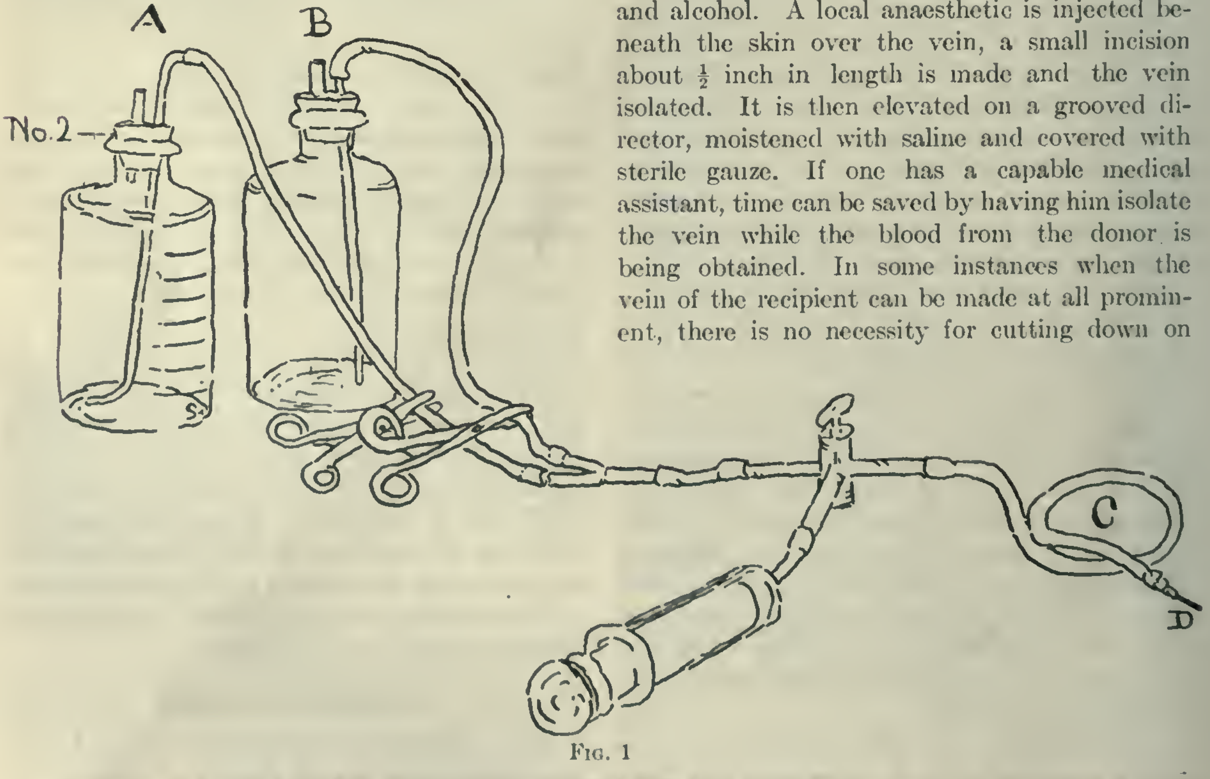

Fig. 1

Illustrating the simple citrated blood transfusion apparatus as it appears when ready for use. Bottle A holds the citrated blood; bottle B holds the normal saline solution.

the vein and exposing it, thus preventing an otherwise inevitable scar and minimizing the amount of tissue trauma and possibility of bacterial infection.

Obtaining Blood from Donor

This is an important step in the technique of blood transfusion. The method of removal is fully as, if not more, important than the method of administration. One should aim at removing the blood as rapidly as possible without producing symptoms in the donor; maintain a steady flow, thus overcoming possibilities of coagulation in the tube; and collect the blood in a bacteria proof container with as little agitation as is necessary to insure uniform mixing with the citrate solution. In the donor, lying on a couch in an adjoining room, a vein is selected preferably at the outer border of the arm in the cubital fossa. The arm is prepared by cleansing with alcohol and ether over the site of the venapuncture, and a tourniquet applied. Having placed in the graduated bottle (*A*), the 50 c.c. of 2% sodium citrate solution in normal saline, above described, the rubber stopper, illustrated in Fig. 2, is tightly inserted. The needle, 14 gauge, one inch, Yale type, is connected with a glass tube perforating the stopper by a piece of rubber tubing not exceeding three inches in length. The length of this rubber tubing is important as the risks of clotting increase in proportion to the length of the tube. To a second piece of small glass tubing which just perforates the stopper, a piece of rubber tubing, one foot in length, with small glass bulb inserted containing sterile cotton, is attached. This is used for gentle suction. An assistant, who may be any intelligent person, is seated on a low stool and is instructed to hold the bottle so that the rubber tubing does not kink and so that there is no tension of the needle as it lies in the vein. He is also instructed to gently agitate the bottle but not to allow the blood to splash as it is received into the citrate solution. He also watches the flow of blood and advises if the flow ceases or is interrupted. When all is ready the needle is thrust into the vein and the operator secures gentle suction by drawing on the tube with his lips and maintains a partial vacuum in the bottle between respirations by compressing the tube between his fingers. The blood, in a steady stream, flows into the bottle and is thoroughly but gently mixed with the citrate solution by the constant motion maintained by the assistant. When the required amount of blood has been secured, usually 500 to 600 c.c., the tourniquet is loosened, the needle withdrawn, and the donor, or an assistant, is instructed to press upon the point of puncture with a sterile swab. In the average transfusion, four or five minutes are required to collect the blood.

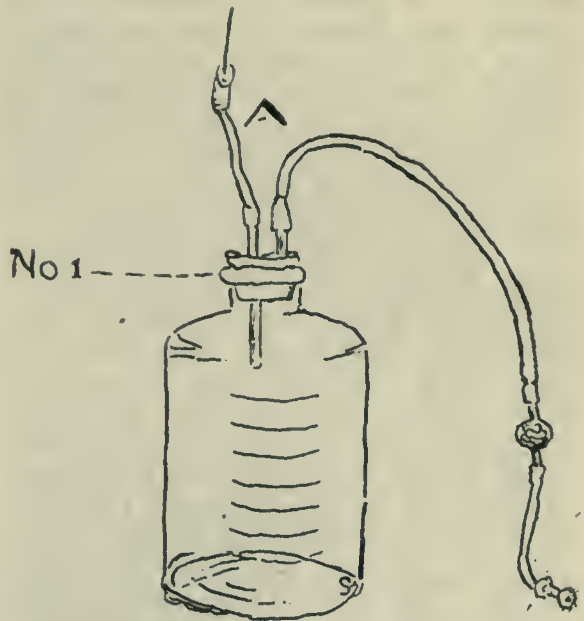

FIG 2

Illustrating the apparatus used to collect the blood from the donor. Note the short tube connecting the needle to the glass tubing which perforates the stopper.

The removal of ½ litre of blood or more should be fraught with no difficulty, if a needle as described above and a connecting rubber tube, not exceeding three inches in length, is used. Occasionally, one will notice that the veins collapse as soon as the blood begins to flow. This is frequently due to a too tightly applied tourniquet which shuts off the arterial circulation. This can be overcome, of course, by slightly loosening the tourniquet. However, the same condition may result even though the tourniquet is not at fault. Under the latter condition the circulation can be maintained and the vessels filled by a slow, regular opening and closing of the donor's fist.

Administration to Recipient

The stopper (No. 1, Fig. 2) used in collecting the blood is now removed from bottle *A*. The second stopper (No. 2, Fig. 1), perforated and carrying a long, bent glass tube so made as to reach the bottom of the bottle at the side (to remove the last drop of blood when the bottle is tilted), is inserted. This stopper, of course, is still connected with the transfusion outfit and as previously mentioned, has already been filled with saline and clamped. The bottle (*A*) containing the blood is now placed in the basin containing water at body temperature and gently agitated by an assistant. By manipulating the stop-cock and syringe, two or three syringe-fulls of warm saline solution are passed from bottle *B* through the rest of the apparatus and discarded: this is done to fill the tubes with saline solution at body temperature. The needle (*d*) which is blunt, 16 guage, and 2½ inches in length, is then introduced into a transverse slit in the vein, tied therein and the transfusion commenced by injecting one or two syringe-fulls of normal saline solution intravenously. By manipulating the artery clamps, which control the flow of both saline and blood, the saline in bottle *B* is now shut off, the clamp on the tube coming from bottle *A* is released, and the blood injected into the recipient. When the recipient has received the full amount of blood, a few more syringe-fulls of normal saline solution are injected into the vein. The transfusion is now complete. The needle is withdrawn, the vein tied off, a suture, if necessary, introduced into the skin and a dressing applied.

Comment

Results obtained by using the apparatus described herein would indicate that post-transfusion reactions, so frequently noted in citrated blood transfusion, can be largely dispensed with. They appear to be due, in most instances, not to the fact that sodium citrate is used but to physical and chemical errors in technique. Reactions may occur after any indirect method of blood transfusion but because the blood with the citrate method is subject to more environmental influences while outside the body, one would expect that post-transfusion reactions would occur more frequently when this anticoagulant is used. This is found to be true in many instances. In the hands of some, as high as sixty per cent. of patients treated with citrated blood show reactions of varying degree. On the other hand, investigators who first introduced the citrate technique and those who have had most experience with its use, have shown that these reactions may be very much less frequent.

While I realize that results obtained in fifteen transfusions are insufficient to prove that technique is the factor responsible for the reactions occurring in citrate blood transfusion still I feel convinced that the changing of my technique from a gravity procedure to the syringe method described herein has been responsible for the sudden cessation of reactions. In these fifteen transfusions no reactions whatsoever occurred, while with the previous use of the gravity method, reactions developed in more than one-half the cases. Prior to, and also subsequent to, the introduction of the method described, sodium citrate, taken from the same stock bottle, was used in the preparation of the 2% solution; this is evidence in favour of the reactions being due to technique rather than to the anticoagulant used.

The factors in the citrate technique which seem to favour post-transfusion reactions are: (1) The too slow collection of blood from the donor, thus permitting to develop the early changes in the blood which are associated with the phenomenon of blood coagulation; (2) undue manipulation, agitation and exposure which favour bacterial and chemical contamination; (3) chilling of the blood obtained from the donor, during the interval it is outside of the body.

In the technique described herein these difficulties have been largely met. To insure rapid collection of the blood, a partial vacuum secured by oral suction has been used; manipulation, agitation and exposure have been minimized by using a single container for the blood which is at all times kept tightly stoppered; chilling is overcome by placing both bottles, *A* and *B*, in a basin of water held at body temperature. The technique described has these further advantages; that the rapidity of administration of the blood to the recipient can be very easily controlled; that normal saline solution at body temperature can readily be injected into the recipient at a moment's notice; and that following the administration of the blood, a few syringe-fulls of saline can be readily injected thus serving admirably in concluding the transfusion.

PROTEIN HYPERSENSITIVENESS AND ITS RELATION TO DISEASE*

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ALTHOUGH the discovery was foreshadowed to a certain extent by the observations of earlier workers, commencing with Magendie, in 1839, it was not until 1902 that an accidental finding by Charles Richet, the French physiologist, paved the way towards a proper understanding of the subject. Richet was working on dogs with poisonous proteins from the tentacles of sea-anemones and mussels, substances, which of themselves, had, on the normal dog, a toxic action of the same general type as certain protein derivatives to be discussed later; and he noted that if a dog, which had received a non-toxic dose, was given a second injection of the same poison after a certain time, there was an immediate violent reaction, often fatal. This was easily mistaken for an accelerated and enhanced reaction; and supposing that he was dealing with something opposed to immunity, he unfortunately applied the name "anaphylaxis" to the phenomenon. This was a fundamental misconception, but the name is now firmly established.

Since then, a large number of investigators have turned their attention toward this subject; and Arthus and others have shown that anaphylaxis—or as it is sometimes called—"allergy," after Von Pirquet, is a condition in which the animal reacts to a normally harmless substance, as to an acute poison, owing to a specific sensitiveness conferred by a previous injection. If a small amount of a foreign protein be injected subcutaneously, intravenously or intraperitoneally, and a second larger injection be made into a vein or the peritoneum, at least nine to fourteen days after the primary dose, the animal dies within five minutes to one hour, the symptoms depending somewhat upon the type of animal utilized. This is active anaphylaxis.

If a guinea-pig be sensitized, say to horse serum, and its serum be injected into a normal guinea-pig, the second guinea-pig, after fifteen to eighteen hours following the innoculation, becomes passively anaphylactic towards the reinjection of an appropriate dose of horse serum. Weil has shown that it is necessary for this latent period to elapse before the animal will show anaphylaxis. With a smaller sensitizing dose, the incubation period is longer, and the minimal dose that will cause anaphylaxis is smaller than when a larger sensitizing dose is employed.

"Anti-anaphylaxis," better called "desensitization" has been the subject of considerable study by Besredka and Steinhardt, and others. For a short period following a non-fatal anaphylactic shock in an actively sensitized animal, the animal is unaffected by subsequent injections of horse serum. This refractory period passes off, and the animal again becomes sensitive to the specific protein, and remains so for months or years. Finally, Rosenau and Anderson showed that if a guinea-pig be injected with horse serum repeatedly every two or three days, a refractory condition is set up, so that for a considerable period of time, anaphylaxis does not occur, when subsequent injections are made. That is, the animal is *immunized*. This eventually passes off. Now, if, during this refractory period, the serum of this guinea-pig be injected into a normal guinea-pig, passive anaphylaxis will be conferred upon the second. That is, the serum or blood of an immunized guinea-pig, is potentially anaphylactic. We will return to all this later.

Pathological Physiology of Experimental Anaphylaxis.

The symptoms occurring in anaphylactic shock vary somewhat according to the type of animal used. The guinea-pig has been the animal chiefly employed, but use has been made also of the rabbit, cat, and dog, while occasionally, man has unwittingly turned himself to account in this connection, in the manifestations of serum sickness, of which more later.

In all animals, severe anaphylactic shock is attended by more or less collapse, with fall in body temperature, the passage of urine and faeces, and death. In the *guinea-pig*, symptoms commence about one minute after the injection of an intoxicating dose of the specific protein. Ushered in by restlessness, bristling of the hair, rubbing of the nose and sneezing, soon there is violent respiratory effort, often with convulsions, collapse and death. Auer and Lewis showed conclusively that the mechanism was to be found in an extreme contraction of the smooth muscle of the bronchioles, in many cases, owing to the natural infolding of the mucous membrane, to the point of occlusion and killing by asphyxiation. At autopsy, besides an acute and extreme emphysema, pulmonary and subpleural haemorrhages are found, which are typical of asphyxia.

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*Read before a meeting of the Montreal Medico-Chirurgical Society, May 4th, 1923. The figures are reproduced through the kindness of Dr. Dale and the J. H. H. Bulletin.

In the rabbit, respirations are increased, but not as in the guinea-pig. Death is due to right-sided heart failure, the result of increased resistance in the pulmonary artery from constriction. The bronchial muscles do not appear to be affected.

In the dog, the important organ concerned is the liver. The liver becomes tremendously engorged on reinjection of the animal with the specific protein, leading to a marked fall in blood pressure. This characteristic reaction as shown by Manwaring, is not prevented by the removal of all the viscera, excepting the liver; and if the liver alone be excluded from the general circulation, the typical fall in blood pressure is prevented. The effect is probably due to constriction of the hepatic vein by its smooth muscles, and to changes in the peripheral circulation, whereby, from loss of capillary tone, and an increased fluidity of the blood, there is an escape of plasma from excessive permeability.

In this connection, it is important to recall the observations of Dale and his co-workers, on the action of histamine, as it goes far towards illucidating this problem. Barger, in 1904, found that the action of ergot on uterine muscle was due to histamine. This is derived from the amino-acid, histidine, a constituent of practically all proteins, by degradation, or by the action of bacteria.

Now, the action of histamine and related protein derivatives, is to markedly stimulate the tone of all smooth muscle—intestinal wall, bronchi and arterial wall. If the blood vessels from any organ from any animal are perfused artificially with Ringer's solution, and an effective dose of histamine be added, there is marked contraction of the arteries, so as to retard the blood flow and cause a shrinkage of the organ. In living rabbits, this same effect is produced, causing a rise in blood pressure from vasoconstriction.

But in carnivora, in monkeys, and probably in man, a small dose of histamine put into the circulation causes a fall of blood pressure, the exact opposite, which conclusively seems to result from a lessening of peripheral resistance—*e.g.,* from vasodilation. That this paradoxical result was not due to nervous influences, was proved by Dale and Laidlaw, and Dale and Richards, by cutting all the nerves to a limb, or to a loop of bowel, and finding actually an exaggerated dilatation. If this denervated limb was artificially perfused, a constricting effect was observed.

Dale and Laidlaw first expressed the opinion that this might be due to an effect of histamine upon the tone of the capillary wall itself. Dale and Richards found in cats what appeared to be definite evidence of an independent variation of the tone of the arteries and capillaries. In short, the dilator effect of histamine was only observed where the capillaries were not already relaxed, and was brought about by depressing the tone of the capillary wall. In the perfusion of organs, this effect was only obtained, when an abundant supply of oxygen to the tissues was insured by the presence of red blood cells in the perfusing fluid, and a small amount of adrenalin was also present. Then was obtained weakening of resistance, accelerated venous outflow and expansion of organ volume. (The capillaries appear to be very sensitive to an adequate supply of oxygen.) Dale arrived at the following conclusion as to the action of histamine upon the blood vessels. A dual mechanism was involved, namely, an increase of the tone of the arterial smooth muscle, and a relaxation of the tone of the capillaries. The capillaries are extremely sensitive to this action, if they are previously in normal tone—0.000,000,01, (one hundred-millionth) part of 1 mg. producing the effect. But if the capillaries are already relaxed, the effect on the arteries will predominate, and a purely vaso-constrictor effect result. When intensified and prolonged, this action results in a circulatory depletion simulating shock.

Krogh has shown that the capillary volume of an active muscle is 275 times as great as the muscle at rest. This dilatation would, of course, insure a greater oxygen supply, and theoretically might be brought about by such substances as histamine resulting from protein metabolism.

The real interest of all this from our standpoint is that there is an extraordinary similarity between these reactions to histamine, in the different animals, and the anaphylactic phenomenon as observed in the same animals. In the dog, we get the same profound collapse of the systemic arterial pressure; in the guinea-pig the same intense broncho-spasm producing rapid asphyxiation; and in the rabbit, the same heart failure from the same cause. In fact, to quote Dale, "The similarity is so striking that it is impossible to avoid the suggestion of a community of cause leading to a community of effect." Some observers have gone so far as to attribute anaphylaxis to the liberation of this substance from the cleavage of proteins.

Bearing on the above is the undoubted fact that there are significant changes in protein metabolism, in anaphylaxis. Longcope and MacKenzie, in their recent article, say: "The weight of evidence points to an increase of the end products of protein metabolism, in both the urine and circulation, and, therefore, supports the assumption that the anaphylactic reaction is associated with an increase of protein katabolism. It seems probable, also, that with this quantitative change, there is also a qualitative alteration in protein metabolism, so that during anaphylactic reactions, nitrogenous substances, not normally formed, are elaborated." In the main, the general conception of the mechanism of anaphylaxis involves the idea that the poison causing the symptoms of shock, results from protein cleavage, brought about by the action of ferments. A number of investigators have set to work to prove the existence of such a ferment. Abderhalden and Pincussohn, and Pfeiffer and Mita, have reported the presence of a ferment, which accumulates during the pre-anaphylactic stage, diminishes during shock, and anti-anaphylaxis, and then appears again in increased amount.

Just briefly, I would like to indicate here some of the ways in which a variation in the degree of hypersensitiveness may be brought about. For instance, if quinine be injected into the animal prior to the intoxicating dose of antigen, the minimal lethal dose is reduced, and the symptoms from a sublethal dose are more severe. The mode of action is not known.

On the other hand, Biedl and Kraus obtain in dogs a non-specific anti-anaphylaxis, by injecting intravenously one-quarter to one-half a gram of peptone per kgm. of body weight. This, undoubtedly, is the basis for Auld's treatment for asthma.

Auer found that atropine protected seventy per cent. of guinea-pigs against the minimal lethal dose of antigen; while ether narcosis, according to Besredka, lowers the mortality of reinjected guinea-pigs, by its action on the bronchial muscles.

Adrenalin, by stimulating the sympathetic, and so relaxing the smooth muscle of the bronchial tree, lessens the anaphylactic action in those animals in which bronchial spasm is a predominant factor. In man, its effects though fleeting, are well known.

Julian Lewis found that if a comparatively large amount of a different protein be injected simultaneously with the sensitizing protein, or shortly afterwards, sensitization is inhibited.

Heinrich and others have suggested that treatment of guinea-pigs by means of the X-ray, suppresses sensitization of the animal to foreign protein.

Etiology.

The etiology and place of formation of the poisonous material which causes anaphylactic shock, has been the subject of much investigation, but, according to Longcope and MacKenzie, is still not satisfactorily settled in many details. There are two main theories:

The humoral theory is based on the similarity between anaphylactic shock and the intoxication which results from the injection of peptones and other products of protein digestion, and depends upon the belief that the circulating antigen and antibody meet to produce a toxic substance from the splitting of the antigen, or from cleavage of blood proteins brought about indirectly. According to Vaughan, the antibody *plus* complement, acts as a proteolytic ferment to bring this about. In this theory, a great deal of stress is laid upon the observation of Friedemann that guinea-pigs may be immediately poisoned, with all the symptoms of anaphylaxis, by an injection of antigen and immune serum, which have been incubated together over a brief period. (According to Weil): The unity of the antibodies in both anaphylaxis and immunity is agreed upon, the difference being determined by the amount of antibody present. When there is only a small amount, as after a single injection, the degradation of the antigen is incompletely accomplished, and toxic proteoses result. When large amounts are present, as after repeated injections, the degradation of the reinjected protein, is carried rapidly to completion, resulting in non-toxic end products characteristic of immunity. The upholders of this theory do not satisfactorily explain the incubation period.

The cellular theory is supported by the work of Schulz, Dale, Laidlaw, Richard Weil, and others. Theobald Smith, in the U.S.A., and Dale, in England, noticed that guinea-pigs which had survived a standardizing dose for antitoxin, had an extraordinary sensitiveness to horse serum. This led to an immense amount of work on the phenomenon of anaphylaxis, as observed in this animal, on account of its special adaptability for the purpose. As a result of this experimentation, the following conditions may be laid down:

(1) A minimal period of six to ten days, according to the size of the dose and the method of giving the reinjection, must elapse before the abnormal sensitiveness can be detected.

(2) The sensitiveness, thus acquired, rapidly reaches a maximum, and lasts the animal's lifetime.

(3) The injection of blood or serum from an anaphylactic guinea-pig into a normal guinea-pig, makes the second animal passively anaphylactic. This would seem to argue for the existence of a specific antibody of some kind.

(4) It takes five or six hours before this passive sensitiveness commences, and it is not fully developed for twenty-four hours. That is, the mere presence of the antibody in the blood is not sufficient to produce the condition. This latent period is necessary, apparently for the antibody to acquire some special relation to the constituents of the body fluids or tissues, before the animal can become anaphylactic. In fact, Weil showed conclusively, that it was impossible to produce anaphylactic shock in guinea pigs by injecting antigen (horse serum) and antibody (guinea-pig serum immunized against horse serum) simultaneously; an interval of time must elapse. Weil further, by a series of ingenious experiments, studied the fate of the introduced immune bodies during the interval. He found no qualitative changes, but quantitatively, there was a marked diminution, so that by the time the animal became fully sensitive, they had practically disappeared from the circulation, as shown by the inability of this animal's serum to confer passive anaphylaxis on a third guinea-pig.

(5) Now, in spite of the disappearance of the antibodies from the blood, they are found to persist in the body; for the animal will still respond with a typical anaphylactic reaction on reinjection with the specific antigen. In a few moments, I shall endeavour to show what has happened to these antibodies.

Dale considered that if the antibody be located within the cells, then the reaction ought to be obtained with the plain muscle isolated from the body, and washed thoroughly from all traces of blood. This he succeeded in demonstrating in a series of experiments, which I shall briefly show in the following slides: In each of these figures, uterine muscle from a guinea-pig, which fourteen days previously had been sensitized by the injection of 0.0025 cc. of horse serum, was used.

Fig. 1 shows the close specificity of the reaction. A horn of the uterus from this guinea-pig was suspended in a bath containing 250 cc. of Ringer's solution. At A, B, C, D, E and F were added 0.1 cc. of sheep, cat, rabbit, dog, and human serum, and egg white. None produced any change in the low tonus and small natural rhythm exhibited by the muscle. At G, 0.1 cc. of horse serum was added, and the plain muscle promptly responded with maximal tonus.

In Fig. 2, the uterus was perfused for an hour with warm Ringer's solution before removal from the body. It gives no response to 0.5 cc. of sheep serum added at A, or to 0.5 cc. cat serum at B, but gives the characteristic reaction to 0.1 cc. of horse serum added at C.

Fig. 3, taken on a fast moving drum, with a time marker, shows that the response to the specific antigen added at A, occurs within ten seconds.

In Fig's 4 and 5, the plain muscle is from a guinea-pig rendered passively anaphylactic to horse serum. The muscle has been thoroughly washed by perfusion, but still shows the characteristic reaction to 0.05 cc. of horse serum, added at A to the 20 cc. of Ringer's solution in which the muscle is suspended. After this effective stimulation, and a change to fresh Ringer's solution at R, the muscle is completely insensitive, responding as little as normal plain muscle to a second similar dose of horse serum added at B.

After being washed again, the muscle was soaked for two and one-half hours in a ten per cent. dilution of serum from guinea pigs anaphylactic to horse serum, and then washed in numerous changes of clean Ringer's solution. The response to a further 0.05 cc. of horse serum

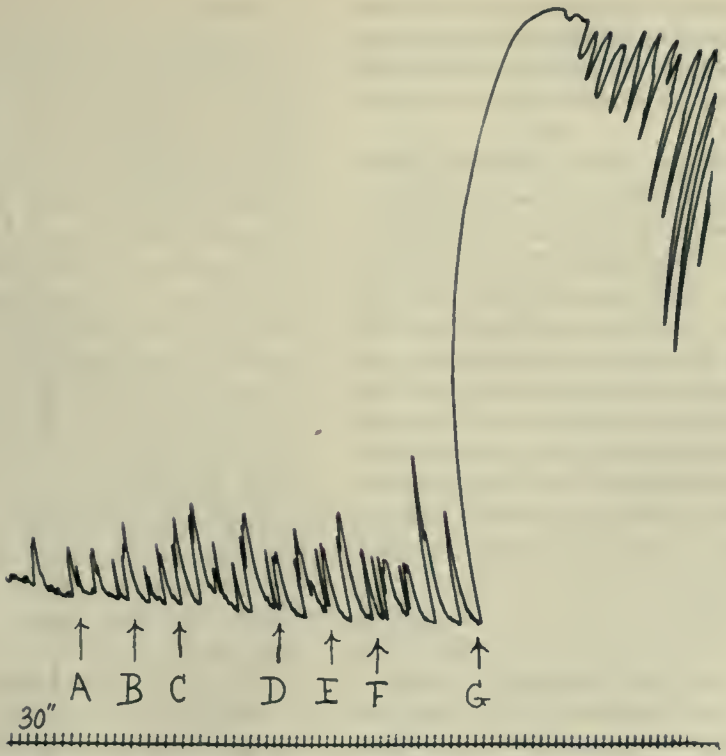

FIG. 1.—Sensitization: 1/400 c. c. antitoxin (horse) 1 test dose of toxin, 14 days. Doses in each case 0.1 c. c. *A*, sheep. *B*, cat. *C*, rabbit. *D*, dog. *E*, human serum. *F*, egg-white. *G*, horse serum. (Jour. of Pharm. and Exp. Therap., Vol. IV., p. 214, Fig. 26.)

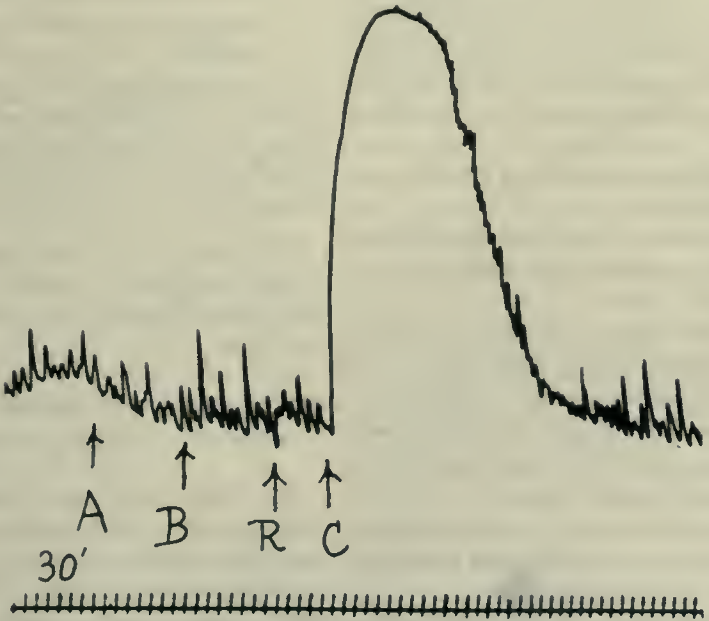

FIG. 2.—Sensitization: 1/540 diphtheria antitoxin (horse) + 1 test dose of toxin, 14 days previously. Perfused. Bath volume 250 c. c. At *A* added 0.5 c. c. sheep serum. At *B* added 0.5 c. c. cat serum. At *R* (in this and all other figures) run off the fluid in the bath, wash out, and replace by clean Ringer's solution. At *C* added 0.1 c. c. horse serum. (Jour. of Pharm. and Exp. Therap., Vol. IV, p. 177, Fig. 1.)

at E.—Fig. 5, shows that passive sensitiveness has been reconferred upon the muscle in vitro and again removed by an effective dose of the antigen, since another dose of horse serum at F is without effect.

Fig. 6 illustrates the response of plain muscle from a guinea-pig rendered immune to horse serum by a series of suitably spaced injections of increasing size. Control pigs treated in parallel with this one, received on the day of this experiment, 5 cc. of horse serum intraperitoneally, without showing symptoms of intoxication. It may safely be assumed, therefore, that the guinea-pig from which the uterus was taken was also immune. Nevertheless, the plain muscle, washed carefully from blood by thorough perfusion, is found to be as highly sensitive to horse serum, of which 0.5 cc. was added at A, as that from many anaphylactic animals.

Since the serum from such immune guinea-pigs is much more effective in conferring passive anaphylaxis, on normal guinea-pigs, than a serum from actively anaphylactic guinea-pigs, the conclusion seems to be inevitable that they owe their immunity to the presence in the blood of such an excess of antibody, that the antigen is fixed before it reaches the sensitive tissue cells.

There are, therefore, two ways in which an animal may lose its specific sensitiveness, once acquired. An effective, but not fatal dose, of antigen, will temporarily free the cells from antibody, and temporary "desensitization," or the so-called "anti-anaphylaxis" results. The second is the much more lasting true "immunity," which results from the repeated graded injections of the antigen.

The following conclusions may be drawn, and here I quote from Weil:

(1) Anaphylaxis is due to the reaction between specific antibodies present in the cells and the introduced antigen.

(2) In passive sensitization, the body cells absorb the introduced antibodies from the blood, and the animal is thus made anaphylactic.

(3) The function of immune bodies present in the serum is to neutralize the introduced antigen and so to protect the body cells.

(4) The anaphylactic animal regularly contains in its circulation an insufficient quantity of antibodies to protect its body cells.

(5) The immunized animal is potentially anaphylactic. Its body cells possess anchored immune bodies, but are protected by those in circulation.

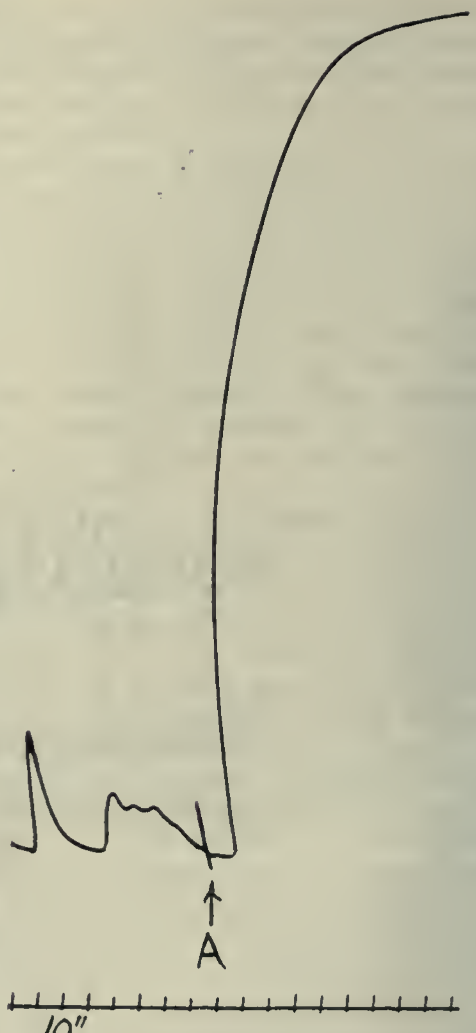

Fig. 3.—Sensitization: 1/480 diphtheria antitoxin + 1 test dose toxin, 14 days. Not perfused. Bath volume 250 c. c. Tracing taken with faster drum than that used in Fig. 2, to measure rapidity of onset of effect. *A*, 0.5 c.c. horse serum. (Jour. of Pharm. and Exp. Therap., Vol. IV, p. 178, Fig. 2.)

(6) Exactly the same antibodies are present in anaphylaxis as in immunity. In the former, they predominate in the cells; in the latter, in the serum.

The relationship of experimental anaphylaxis to diseases in Man.

It is admitted that anaphylaxis, as studied in animals, aids us materially in a proper understanding, by deduction, of a number of pathological processes in man. First there is the definite disease, "serum sickness," and then come certain "idiosyncrasies," and thirdly, intoxications by protein derivatives.

Serum disease results from the injection of heterologous sera in humans, and presents a more or less definite syndrome, of glandular enlargement, fever, an itchy rash—urticarial, erythematous or scarlatiniform, joint and muscle pains, oedema, nausea and vomiting. There are three recognized types, depending, according to von Pirquet and Schick, on the length of the incubation period. In the normal reaction, characteristic symptoms come on in six to ten days; an "accelerated" type is recognized in which symptoms appear in three to five days after the serum injection; the "immediate reaction" occurs within twenty-four to forty-eight hours.

The "accelerated reaction" is more apt to occur, in persons who have had a previous injection of the same foreign serum, especially if within one or two years. This state of hypersusceptibility is the only effect which remains, and may persist for five to eight years, so that an accelerated or immediate reaction may result. The disease may last only a day or so, or may last two to three weeks. Relapses, with the reappearance of the rash are recognized. These may be explained by the fact that the incubation periods for the different constituent proteins occurring in horse serum are separated by some days. In horse serum, there are three proteins—euglobulin, pseudoglobulin and albumin. Dale noted that the uterus of a guinea-pig, simultaneously sensitized with these constituent proteins, will become anaphylactic to these separate proteins at different times.

I shall have a word to say later, in regard to the "immediate reaction" when dealing with the hereditary factor in these conditions.

Rackemann, Longcope and Peters showed that during serum sickness, there is a marked but transient retention of chlorides and water, associated sometimes with slight albumin and casts in the urine, and occasionally an impaired phenolsulphonephthalein test. In those with oedema and increase in weight, diminished plasma chlorides were found. No change was found in the non-protein-nitrogen, or blood urea. The normal factors concerned with the coagulation of the blood appeared to prevail.

Specific precipitins for horse serum are found in the circulating blood of a patient with serum disease. It used to be thought that the union of these precipitins with the antigen within the blood stream was the cause of the sickness, but MacKenzie, Leake, and others show them to be the result rather than the cause, acting rather as a protective mechanism to rid the body of the antigen. In those individuals who are not susceptible to serum disease, no such precipitins are demonstrable, and the antigen or horse serum continues to circulate as a harmless substance for weeks or months.

It is more difficult to correlate the experimental work with the subject of hypersensitiveness, which includes such idiosyncrasies as hay fever, asthma, certain gastro-intestinal disturbances and such skin manifestations as eczema and urticaria. In these conditions, inhalation, ingestion or skin contact with the offending substance may bring about the typical manifestation. The severity of the symptoms may vary from a mild rhinitis to shock. Apart from serum sickness, it is not understood how the individual becomes sensitized—although Schloss and others have shown that infants may absorb egg albumin from the intestinal tract and excrete it in the urine, unchanged. This absorption is more apt to occur during gastro-intestinal disturbances, where presumably there may be damage to the mucous membrane of the bowel. But it is questionable whether the small amounts absorbed in this way, could account for an extreme hypersensitiveness; for man is less readily sensitized than the guinea-pig, and in this animal sensitization through the mucous membrane is more or less difficult.

An extremely important factor appears to be a familial tendency towards idiosyncrasies of this kind. In these naturally hypersensitive individuals, occur the most violent reactions, and to this group probably belong the bulk of those cases in which violent anaphylaxis occurs, as a result say—of the administration of antidiphtheritic or antitetanic serum. Certainly—accidents of this kind—during the late war were the rare exception, where thousands of men were given antitetanic serum—with no precautions. To illustrate this "immediate" reaction—I should like to quote from a letter which I recently received from Dr. Brow—from the Hospital of the Rockefeller Institute. Dr. Brow was testing out a pneumonia patient for sensitivity to horse serum prior to the administration of type I serum. He says, "I had given this patient 1/200 cc. of 1 in 10 horse serum intradermally, and ten minutes after the injection, he became almost *in extremis*—dyspnoeic, coughing, markedly cyanosed, oedema of lips, eyelids, ears and conjunctivae, with a widespread urticarial rash and erythema. For a few minutes he seemed 'a goner'—but he finally came round with adrenalin." Boughton, in 1919, reported a case

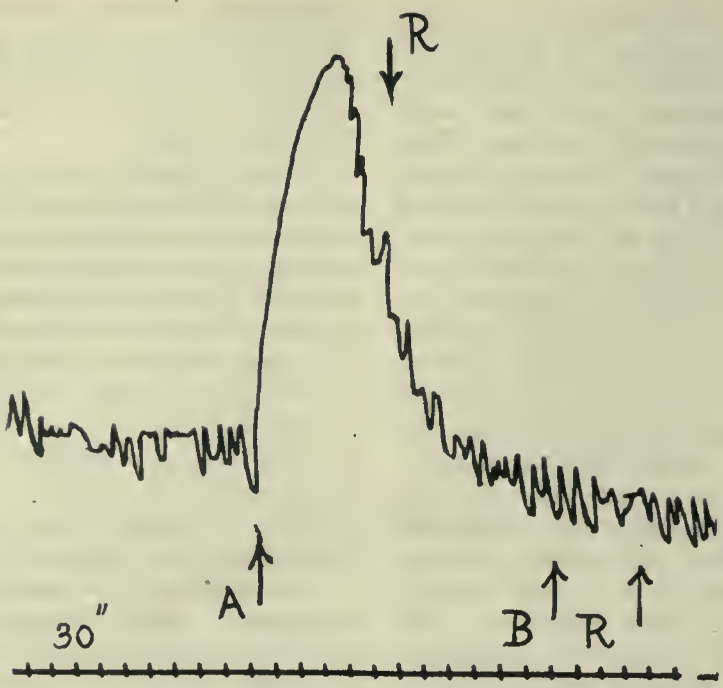

FIG. 4.—Passive sensitization with serum from guinea-pigs anaphylactic tc horse serum (see test). Perfused. Bath volume 20 c. c. *A,* 0.05 c. c. horse serum. *B,* the same. (Journ. of Pharm. and Exp. Therap., Vol. IV, p. 198, Fig. 15.)

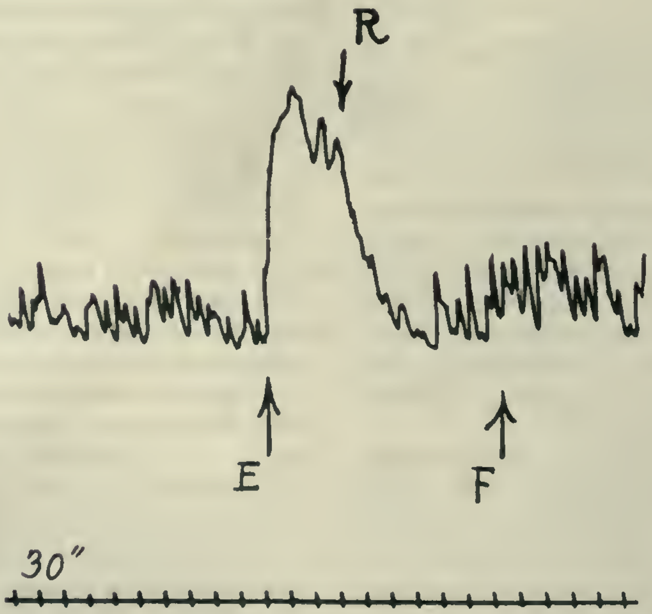

FIG. 5.—Same experiment as in Fig. 4. After resensitization *in vitro* by soaking for 2½ hours in 10 per cent serum from horse sensitive guinea-pigs. *E,* 0.05 c. c. horse serum. *F,* the same. (Journ. of Pharm. and Exp. Therap., Vol. IV, p. 199, Fig. 16.)

of anaphylactic death occurring in a male patient, aged twenty-nine years. This man gave a history of asthmatic attacks from the age of ten years. While in the army, it was discovered that proximity to horses precipitated attacks of asthma. His physician attempted to desensitize him, and death occurred in ten minutes after an intravenous injection of 1 minim of horse serum. The lungs when examined were enormously distended and emphysematous, and there was a small area of haemorrhage. In this and the preceding case, the reaction presents great similarity to that occurring in the guinea-pig, in anaphylaxis.

In the hypersensitive individual, we get reactions to the specific protein when applied cutaneously on a small scarified area; or intradermally; or on the mucous membrane. Reactions are as a rule prompt, consisting in an urticarial wheal and surrounding erythema. The intradermal tests, are, by Walker and others, considered too delicate; while some workers claim that if the individual be only slightly sensitive, his skin will react to the test only in this way.

Recent observations by MacKenzie and Baldwin would seem to indicate that these local reactions are probably true cellular reactions, with the introduced antigen. So, the repeated application of the offending protein to the same area of skin, leads to a gradual and progressive exhaustion of the sensitivity of that area, until no reaction is obtained. This exhaustion of reactivity appears to be specific for that protein only, and lasts three to five days. They believe that this explains the beneficial results which are obtained by the feeding of egg-white in gradually increasing doses to a child who is sensitive to it, and also the amelioration of symptoms in hay fever from the use of a spray of a weak dilution of the offending pollen, as has been shown by MacKenzie.

The specific sensitiveness seems to pick out certain tissues, we know not how. It possibly is explained by a *locus minoris resistentiae.* In one case, it is the nose that bears the brunt of the attack, so as to show a lowering of capillary tone, resulting in the typical hay fever, or vasomotor rhinitis; in another, it is the smooth muscle of the bronchioles that is affected; while in a third, it is the skin. I have known a case in which eczema and urticaria, unexplained recurrent vomiting—and violent asthma—were all manifestations in the same individual of a specific hypersensitiveness to wheat globulin. The experiment of Auer is extremely suggestive in connection with the point of attack. He found that

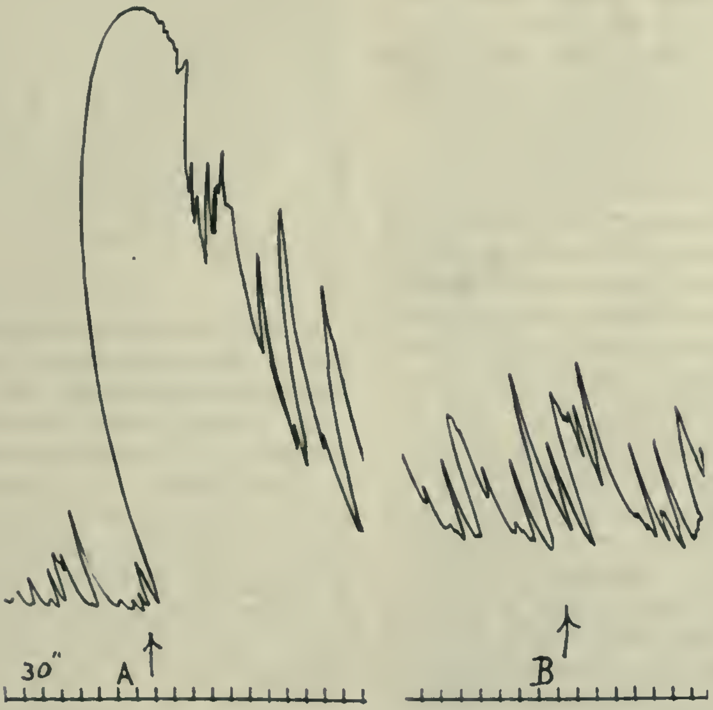

FIG. 6.—Guinea-pig immunized to horse serum. *A*, 0.5 c. c. horse serum. *B* (after change), 0.5 c. c. sheep serum. (Journ. of Pharm. and Exp. Therap., Vol. IV, p. 194, Fig. 13.)

if a rabbit be sensitized to horse serum, and prior to the injection of the intoxicating dose of horse serum, its ear was irritated with xylol, there was a marked local reaction at this point on reinjection of the animal. This is explained on the assumption that the local inflammation set up by the xylol leads to an escape of serum, and antigen at this point, so that the circulating antigen is brought into immediate contact with sensitized cells.

Had we time, we might speak of idiosyncrasies to drugs, such as arsenic, salicylates, etc., which so far as we know, contain no protein. Even skin reactions may be obtained. It has been suggested that the drug or metal may in some way unite with the blood serum of the individual, to produce a new protein.

This is an effort to bring before you, in rapid survey, the knowledge which we have, up to the present time, of this important and fascinating subject.

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Treatment of High Blood Pressure.—J. Henderson (Glasgow Med. Journ., April, 1923, p. 209), in considering the treatment of high blood pressure, points out that in many cases some degree of high pressure may be compensatory, its existence, without associated symptoms, not calling for attempts at reduction, the aim rather being to prevent further rise. In this direction much may be done by regulation of the diet, bowels, and exercise, and restriction in food intake, especially fluids; no meat, seasoned foods, alcohol, strong tea, or coffee should be allowed. Purgation by drugs which remove large quantities of fluid—for example, calomel, julep, and elaterium, with morning salines—is important. Suitable exercise is essential, but all mental and physical overexertion must be avoided, and when there is evidence of cardiac distress complete rest in bed may be needed for a time. Venesection may be of use as a temporary measure in a crisis, and carefully regulated hot baths are of value in increasing elimination by the skin and lungs. Vaso-dilators should not be employed too early; amyl nitrite and nitroglycerine produce a sudden temporary lowering effect, while sodium nitrite in 3-grain, or even 5-grain, doses several times a day gives the best sustained effect and may be beneficially combined with a diuretic or diaphoretic. The best results from potassium iodide are obtained when it is given in small doses over long periods with occasional intervals of rest; digitalis is not contraindicated in the presence of threatened heart failure. It is claimed that high frequency currents have a sustained action in lowering pressure without undue cardiac depression, but the author's experience of an extensive trial did not support this, although the patients often feel temporary benefit. The importance of prophylaxis is pointed out, and it is suggested that people over the age of forty would do well to be overhauled occasionally from this point of view.—*Brit. Med. Jour.*, June, 1923.

A Case of Pharyngeal Diphtheria Probably Due to Auto-Infection from a Diphtheric Lesion of the Thumb.—The case reported by A. H. Baldwin, F. McCallum and J. A. Doull, Baltimore, presented these interesting features: (1) a laboratory wound infection in a person known to have given a Schick positive reaction; (2) a probable transference of the bacilli to the mouth during sleep; (3) a rapid disappearance of throat and wound lesions on the administration of antitoxin.—*Jour. Am. Med. Ass.*, May 12, 1923.

Building Sound Bones.—Sunlight and nourishing food mean a sturdy youngster, almost too active for the mother's peace of mind; the lack of them means a round bellied little child waddling on bowed skinny legs. It isn't always the child of the wealthy who is sturdy, however, for although his parents can afford sunlight, they also afford food too rich for his little digestive system and entertainment too frequent and too exciting for his little nervous system.—Hygeia.

Retrospect

CYANOSIS

Lundsgaard, C., and Van Slyke, D.
Medicine, 1923, II, 1-76.

MAUDE E. ABBOTT, M.D.
Montreal

THIS important monograph presents what may be termed the last word to date from a series of studies on the oxygen content of the venous blood and the causation of cyanosis in various normal and disordered conditions of the circulation that have been carried out by Lundsgaard and his associates during the last five years by means of the method and apparatus devised by Van Slyke, for the estimation of its oxygen content and oxygen combining capacity (reduced haemoglobin). The conclusions formulated and applied here are based upon large series of experments reported in these earlier publications,[*] which may be re-read with much interest in this connection. Certain values for oxygen consumption under similar conditions of the circulation, obtained by Lundsgaard in earlier researches[†] upon the gaseous content of the alveolar air by the nitrous oxide method of Krogh and Lindhard are also quoted for purposes of control and comparison. The result is a mass of authoritative and exact quantitative information upon the nature and interrelationship of the various etiological factors taking part in the phenomena of cyanosis, which dispels much of the confusion surrounding our ideas of this condition and also throws a searchlight across many obscure questions in cardiac decompensation. The problems that have been attacked and disentangled are so complex and their solution here is of such great practical importance in clinical medicine that a somewhat detailed review is desirable.

The authors begin with a brief introductory statement defining the term cyanosis as "a diffuse bluish discolouration of the skin and mucous membrane, more marked in certain regions of the body than in others, (lips, fingers, etc.,), but generalized in its distribution and varying both in shade of colour from heliotrope to leaden, and in degree of intensity, in different cases, according to the variations in the conditions inducing the essential cause, which is defined as a change in the character of the blood, due either to an increase of the reduced haemoglobin physiologically present, or to the formation of the abnormal components, methaemoglobin and sulphaemoglobin." The present enquiry is confined to that form of cyanosis produced by an increased amount of reduced haemoglobin in the blood. To express the volume of concentration of this body the term "oxygen unsaturation," now in general use, has been introduced by Lundsgaard, for the reason that oxygen values are thus experimentally determined and are, therefore, most convenient both for notation and expression. This term is employed throughout in this article, and the calculation is made that, since 1 cc. of oxygen combines with 0.75 grams of haemoglobin, 5 grams of haemoglobin may be expressed as $\frac{5}{0.75}$ or 6.7 volumes per cent. of oxygen unsaturation, which has been experimentally determined by the authors to be the "threshold value" at which cyanosis may be expected to appear. This figure is in volumes per cent. of 100 cc. of haemoglobin, and it has been arrived at by taking the average or mean of the oxygen unsaturation of the arterial and venous bloods (at the entrance and exit of the capillary) obtained by the Van Slyke method as follows: $C = \frac{A+V}{2}$; for we understand by cyanosis the altered colour of the blood as it is seen through the *capillary* walls.

The essential or primary cause of cyanosis having thus been established as an increased "mean capillary oxygen unsaturation" of known "threshold value," the various elements entering into its production and modifying the character and intensity of the cyanosis to which it leads are discussed. They are divided by the authors into two groups, (*a*) modifying factors, and (*b*) factors directly *influencing the concentration of reduced haemoglobin* (*oxygen unsaturation*) *in the blood stream.* As modifying factors are enumerated, (1) the thickness of the epidermis, (2) the normal pathological pigmentation of the skin, (3) the colour of the blood plasma, (4) the concentration of oxyhaemoglobin in the blood, (5) the number, width and extent of the blood-filled capillaries of a given surface area, (6) the extent to which the oxygen unsaturation in the capillary approximates more closely to that of the artery or the vein with which it communicates (oxyhaemoglobin-dissociation curve). The fifth factor, the increase in size and thickness of the wall of the surface capillaries, which has long been recognized as a constant and prominent feature in all cyanosis of long standing, has been much elucidated by recent advances in methods of investigation, such as the invention by Lombard and Weiss of capillary microscopy, and the discovery by Krogh of a "capillary motor function." The results obtained by these authors in proving by actual measurement the increase in size and number of the capillaries are fully described and figured, as also the alterations in the capillaries in polycythaemia, acro-cyanosis, stasis of cardiac origin, or produced by thermic stimuli, etc. The sixth factor, changes in the oxygen content of the capillary blood as it passes from its arterial to its venous end, is represented graphically as a curve which may be greater at either arterial or venous end according to the conditions; for practical purposes of calculation these variations are ignored and the "mean capillary unsaturation" is considered to be the average, that is the exact half of the volumes per cent. of the oxygen unsaturation in the arterial and venous ends, which gives, for purposes of calculation the simple formula C (mean capillary oxygen unsaturation) = $\frac{A+V}{2}$, A representing the arterial, and V the venous, unsaturation at either end of the capillary.

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[*] Gasometric Determination of Oxygen and Haemoglobin of the Blood: D. D. Van Slyke, *Jour. Biol. Chem.*, 1918, XXX, 127-132. Studies of Oxygen in the Venous Blood in Normal Individuals: C. Lundsgaard, *Ibid*, 1918, XXXIII, 119-144. Studies on Oxygen Unsaturation in the Venous Blood in a Group of Patients with Circulatory Disturbances: C. Lundsgaard, *Jour. Exp. Med.*, XXVII, 179-247. Studies on Cyanosis, its Primary and Secondary Causes—Erythrosis or False Cyanosis: C. Lundsgaard, *Jour. Exper. Med.*, XXX, 259-269, 271-293.

[†] *Untersuchungen ueber das Minutenvolumen des Herzens*: C. Lundsgaard, *Deutsch. Arch. f. klin. Med. Leipz.*, 1916-16, cxviii, 481; 1916, cxx, 481.

The second group of factors, those influencing the concentration of oxygen unsaturation in the blood, is by far the most important part of this communication, and is that which gives to it its epoch-making character. Four possible factors are recognized, the decreased pulmonary oxygenation, increased haemoglobin total, stasis in the systemic capillaries, and entrance of arterial blood into the arterial stream. Each of these factors can be stated quantitatively and the "normal values" in terms of mean capillary oxygen unsaturation, have been numerically established. By a brilliant process of reasoning, the effect of the relative magnitude of each upon the "threshold value" of each of the others has also been calculated. The following brief outline of the figures and symbols used is necessary for their clear exposition:

The oxygen capacity of the blood is normally about twenty volumes per cent., and in normal individuals the blood emerges from the lungs ninety-five per cent. saturated; that is, the arterial blood normally contains nineteen volumes of oxyhaemoglobin and one volume per cent. of oxygen unsaturation; this portion which passes through the lungs unsaturated under physiological conditions is called l; and an increase of it in the arterial blood coming from the aerated parts of the lungs beyond the one volume per cent. physiologically present is our first "influencing factor" in the production of cyanosis.

In passing through the tissues, the blood loses five volumes per cent. of oxygen and it, therefore, emerges in the veins with fourteen volumes per cent. of oxyhaemoglobin and six volumes per cent. of oxygen unsaturation, making the normal "mean capillary unsaturation" $\frac{1+6}{2} = 3.5$ volumes per cent. The amount of oxygen thus lost in passing through the tissues (five volumes) is called D. It is readily understood that if through slowing of stream in the capillaries or other cause, oxygen consumption in the tissues be raised beyond five volumes per cent., the "threshold value" of cyanosis will be passed. D is thus a second possible factor in the production of cyanosis.

The third factor is pointed out to be an increase of the total haemoglobin in the blood. This is called T. An increased T tends to influence the degree of oxygen unsaturation produced by decreased pulmonary oxygenation (increased l) and acts in conjunction with this factor to deepen the cyanosis, but is of relatively little effect alone.

Finally, a fourth factor arises in certain pathological states of the circulation, when, either by passage through a cardiac septal defect in certain congenital lesions, or by passage through a part of the lung which is entirely cut off from its air supply, as in pulmonary emphysema, a portion of unaerated (venous) blood is projected directly into the arterial stream. To this "right to left shunt" of the circulation the symbol a has been given. It is regarded as a very powerful factor in producing cyanosis, and when it is combined with an increased D (stasis in the systemic capillaries) as is very commonly the case, its effect is very marked.

These factors thus act in pairs, T increasing the importance of l, and D the seriousness of a. From formulae based upon the simple initial one that $C = \frac{A+V}{2}$, together with the actual values of T (obtained by direct estimation of the haemoglobin content), and of l and D (by determination of the reduced haemoglobin in the arterial* and the venous blood respectively), the value of l, that is, the amount of oxygen unsaturation transmitted by the right to left shunt, may be numerically determined in any given case where the diagnosis is made.

The relative magnitudes of these factors are shown graphically in terms of mean capillary oxygen unsaturation, by curves calculated numerically on the basis of experimental determinations, in the form of three charts, which present this remarkable series of inductions in a highly ingenious manner. In the first of these, the relation of all four curves to each other and to the normal threshold values of capillary oxygen unsaturation appears. From it, it is evident that of the four factors l and a, the unsaturation of the blood coming from the aerated parts of the lungs and the shunt of venous into arterial blood), are the most severe in their influence, in that they approach most quickly the threshold value, rise higher, and produce cyanosis at a smaller deviation from their physiological values, other factors remaining normal, than any other; and that T has the lowest range of all in its influence on unsaturation and cannot of itself reach the cyanosis threshold. The two other charts show by means of the same curves the interaction of these four factors in pairs, l with T (decreased pulmonary oxygenation and increased haemoglobin content—witness the mountain sickness of the polycythaemia of high altitude); and a with D (shunting of venous into arterial blood with stasis in the systemic capillaries, as in pulmonary stenosis with septal defect and in pulmonary emphysema).

The clinical conditions associated with cyanosis are next briefly reviewed and the factors at work analyzed. In tracheal and bronchial stenosis, where the obstruction is only partial, in bronchitis, bronchial asthma, emphysema, influenzal pneumonia (especially that of the "heliotrope" type) and oedema of the lungs, an increased l, due to lowered diffusion of oxygen from fluid in the alveoli and other causes, is the chief factor at work. Hence the value here of oxygen therapy. In complete obstruction of the bronchus or in certain cardiac septal defects, or again, in certain types of pneumonia the a factor is present, in that a stream of entirely unaerated blood is deflected into the arterial stream. Under these conditions the author has demonstrated that, other factors being equal, cyanosis does not appear until one-third of the pulmonary circulation is so deflected, or until the venous blood passing through a septal defect assumes this proportion to the arterial current into which it flows. Oxygen therapy is here, of course, of no value. Again, in cardiac decompensation of myocardial origin, as in aortic and pulmonary stenosis, an increased D from stasis of the stream produces the chief effect, while in mitral lesions we have both an increased l and D at fault.

The subject of a "left to right shunt" of arterial into venous blood, such as occurs in so-called compensated cardiac septal defects, is discussed at some length. It has, of course, no bearing on the causation of cyanosis.

The monograph closes with a complete bibliography following upon an historical survey of our knowledge of this subject. In the latter connection it is of interest to note that Senac, in 1749, in reporting the first fully studied case of congenital cyanosis with autopsy, pointed out, with truth, that a right to left shunt (a) through a deficient septum was here the factor producing the cyanosis; and that Morgagni, in 1761, in making the then apparently conflicting statement that the cyanosis in pulmonary stenosis was due to stasis of the stream (Lundsgaard's D factor) was equally in the right!

In conclusion, this review cannot fairly end without a word of comment on the epoch-making character of the communication here presented. From a careful study of it and of the various charts and diagrams with which this article is enriched, numerous inevitable and highly suggestive inferences present themselves to the reader, which are borne out at all points by the clinical and pathological facts of congenital cardiac disease. In the revelation here presented of the scope and value of the knowledge both of the circulation and the respiration that has become available to us through the Van Slyke technique, we stand as it were before an open door through which a stream of light radiates into the very heart of cardiac pathology. Moreover, the brilliant series of inductions by which the facts so obtained have been applied to the elucidation of this obscure subject, seem to us to have their only parallel in this field in the great work of Rokitansky on cardiac defects, which formulated, on the basis of physiological law, hypotheses of far-reaching significance that have since found their verification in the previously uncorrelated morphological details.

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*The capillary blood obtained by cutting the finger without pressure is found to be sufficiently close to the arterial blood in oxygen content for use.

THE BLOOD SEDIMENTATION TEST:—ITS HISTORY, TECHNIQUE, NATURE AND CLINICAL APPLICATION*

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Many years ago when blood letting was the almost universal treatment of disease the observation was made by Galen, Hunter, Virchow, Wunderlich, and others that in some affections, particularly the acute inflammatory processes, there occurred a marked acceleration of sedimentation of the blood cells in the drawn blood. This was at times so rapid that, even in the absence of a substance to prevent coagulation, there occurred before coagulation set in a partial sinking of the cells away from the surface, leaving a clear, yellowish serum. This was given the name *crusta phlogistica* or *crusta inflammatoria* and was looked upon as an extremely grave sign. With the gradual exit of "bleeding" as a therapeutic measure in such conditions, the phenomenon was forgotten or at least disregarded. Recently in 1917, Robin Fahraeus of Stockholm, working in the Physiological Institute of the University of Kiel, rediscovered the fact, and in articles published in *Hygica*, in 1918, and in the *Biochemische Zeitschrift* of the same year, stated that the phenomenon might be employed in the form of a test for pregnancy, as there was considerable acceleration of sedimentation velocity in that condition. He noted that it occurred also in infectious diseases and malignant tumours. Linzenmeier, of Kiel, also took up the question, developed a precise technique, and applied the test to a large gynaecological service. Many others followed and soon continental literature was flooded with a wealth of articles dealing with the various phases of the phenomenon; some interesting themselves with its explanation while others applied the test to the difficulties of clinical diagnosis.

The Technique

True to the spirit of modern scientific medicine, the workers on this subject immediately fell to the task of establishing a definite technique whereby the change in velocity of sedimentation of the red cells could be expressed numerically. Various methods have been advocated, all more or less alike, but differing in the size of tube and amount of material employed and the so-called "end-point" or time of reading. More recently the method brought out by Linzenmeier has been quite generally accepted and adopted. His own description of his technique is as follows:

Necessary utensils: (a) A 1 ccm. glass syringe tested to 1 ccm. and with divisions into tenths. (b) Small settling-tubes about 6.5 cm. high and 5 mm. clear breadth, which will contain somewhat more than 1 ccm. and bear the following marks: An upper mark which corresponds to the bottom of the meniscus formed when 1 ccm. of water is placed in the tube and below this four other marks at distances of 6, 12, 18, and 24 mm., respectively, from the 1 ccm. line. (c) A 5% sodium citrate solution in a wide-necked flask. (This becomes turbid after long use and must be replaced).

Technique: (1) The syringe to be used must be completely dry or rinsed with the sodium-citrate solution. (2) 0.2 ccm. of the sodium-citrate solution is drawn into the syringe. (3) The sedimentation tube must be absolutely clean and dry. (4) The cubital vein is punctured after short stagnation of the blood. (Long stagnation tends to increase the red corpuscle content and to allow carbonic acid increase in the blood which alters the result). (5) Withdrawal of 0.8 ccm. of blood into the syringe, making with the 0.2 ccm. of sodium-citrate which it already contains, 1ccm. (6) The syringe is immediately emptied into the sedimentation-tube, which should be filled exactly to the 1 ccm. mark. (7) Mixing of the solution and blood to prevent clotting by slowly inverting the tube twice. (8) Note the time required for the line of separation between blood corpuscles and plasma to reach the various lines,—that is 6, 12, 18, and 24 mm. below the 1 ccm. mark. This is the sedimentation time. (9) The tube should be placed in perfectly perpendicular position at room temperature. (10) Should the reading be omitted at the right moment or, due to rapid sinking, should the line of demarcation between plasma and corpuscles be indefinite, they may be remixed by inverting the tube several times and the results again estimated. (11) In case of clotting, the test should be discarded. This is due to improperly cleaned tubes or the presence of a small amount of water containing calcium in the tubes. The temperature should not vary greatly, as higher temperatures accelerate the sedimentation velocity.

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*Read before the Osler Reporting Society, Montreal.

Linzenmeier recommends using the 18 mm. line as the most practical end-point, while others prefer the 24 mm. line. According to Pewny, the height of the column of fluid and the breadth of the tube, with the exception of very narrow tubes, make no difference in the result. This, of course, is not correct, as a study of sedimentation curves in different sized tubes will show. The discrepancy is small at first but increases as time goes on.

Results may be compared with the normal and the increased velocity expressed as a ratio, *e.g.*, 3 to 1, etc. Another method is to express the result by the height in centimeters of the column of clear fluid at the end of one hour. Five-tenths of one cm. is normal for adult males. Very interesting comparisons and more vivid representations of results can be gained by plotting the curve of sedimentation. One employs as ordinates the percentage which the height of the corpuscle column bears to the height of the whole suspension and as abscissa the time of standing expressed in hours. Starting at the top, or 100% mark on the first abscissa, it will be found that normal sedimentation is represented by an almost straight line which runs obliquely slowly toward the base; on the other hand a rapid sedimentation gives a line which falls rapidly and then flattens out as it nears the base. Very interesting changes in velocity from time to time during the same test may occur, though in the majority of cases the line or curve is regular.

The test is frequently referred to in German literature as the "B.S." test as a contraction for "Blutkoerperchensenkung," and an acceleration over the normal velocity, or "Senkungsgeschwindigheitbeschleunigung," as "S.B." It would seem that sedimentation velocity best expresses the equivalent in English and "S.V." test would be a proper contraction. Negative results are those in which the time is within normal limits considering the age of the individual; while positive results are those showing an appreciably increased rapidity of settling.

Nature of the Phenomenon

A considerable amount of work has been done and many papers have appeared in explanation of this phenomenon. It was early assumed that the secret lay in an autoagglutination of the erythrocytes whereby large aggregates were formed. These, by their considerably diminished surface, sank much more rapidly than single corpuscles. The question then arose as to the cause of this autoagglutination. The nature of agglutination in general is still not fully explained. There are two schools: one, the older, headed by Gruber and supported by some research of Arrhenius, sees the cause in the adhesiveness of the cell surfaces; the other, more recent and now more generally accepted, explains agglutination by an adsorption phenomenon resulting from the lowered electrical burden of the suspended particles, in other words, the stability of a cell suspension depends on the electrical burden of the particles being maintained at a certain height. Hoeber showed, in 1904, that erythrocytes wander to the anode and, therefore, carry a negative electric charge, and was of the opinion that this burden was carried by the plasma surface. Schurer and Eimer, moreover, showed that the corpuscles of healthy men wander to the anode much more quickly than those of pregnant women and concluded, therefore, that in pregnancy and certain disease conditions the electrical burden of the cells is diminished and consequently, agglutination more rapidly occurs and sedimentation velocity is increased. This conception of the phenomenon is more or less substantiated by the fact that it requires the addition of less lanthanum, a very positively charged metal, to bring a rapidly sinking corpuscle suspension to the isoelectric point of neutrality than a slowly sinking one. Furthermore, Linzenmeier has shown that if the plasma is treated with substances which are adsorbents for positive particles the negative burden of the corpuscles is increased and the stability of the blood is raised.

Attention was more or less diverted for a time from this original physical conception by researches which showed that rapid sedimentation was associated with changes in the relative proteid composition of the plasma, as, for instance, an increase in the globulin fraction and a decrease in the albumin. The followers of Hoeber's ideas, however, showed that these different proteids exert different influences on the electrical burden of the corpuscles, and that the negative burden is greater in albumin than globulin solutions. Consequently, if globulin replaces albumin in the adsorption envelope of the corpuscles, the isoelectric point is approached and more rapid sedimentation occurs.

Viscosity is a very variable quality of the blood which, quite naturally, was early thought to be important in this connection. So many factors, however, enter into its production that clear-cut conceptions of its alteration are difficult to obtain. Nevertheless, most interesting for our subject is the fact that the grade of viscosity of proteid solutions is indirectly proportional to their electrical burden; globulins having a very high, albumins a relatively low, viscosity. Therefore, as Hoeber states, if the globulin of the blood plasma is increased and the albumin is diminished, two changes take place which unite in aiding agglutination of the red cells and, hence, sedimentation. In the first place, the viscosity is raised and the more viscid protein particles cling more readily to the corpuscles, and the corpuscles to each other; and, in the second place, the electrical burden is diminished, the isoelectric point is approached and the corpuscles tend to aggregate. In other words the two theories of agglutination, both the older, which sees the cause in increased adhesiveness, and the younger which emphasizes the adsorption changes resulting in diminution of the electrical burden, meet on common ground.

Other possibly less important factors which influence the sedimentation velocity are the number and size of the red blood cells. It is quite obvious that a reduction in their number will tend towards acceleration; while in polycythaemia the reverse will hold true. Increased size of the corpuscles, as I recently observed in a case of pernicious anaemia with relatively high count but extreme macrocytosis, must of necessity have its influence.

Results of the Sedimentation Velocity Test in Health

It is rather difficult to correlate the findings of different workers with this test in normal individuals. This is due to the diversity of methods, and therefore, very much as in blood coagulation estimations, each author sets his own standards of normal. However, all agree in a relative way. Employing Linzenmeier's technique outlined above and the 24 mm. line as end-point, one finds that the sinking time in the new-born up to the fifth week is 1,500 minutes, from then on there is a marked drop or shortening of the time throughout youth (up to 14th year). The reading in apparent health during this period may be as low as 100 minutes. Some consider this irregularity during youth is due to lack of stability and the influence of many minor infectious diseases which alter the results. The velocity at this age period is on an average double that of healthy adult males and there is no difference between the sexes. However, both Bardach and Opitz-Frei observed considerable inconstancy of results in normal children at repeated sittings. Fully developed males in health give a sinking time of 1,200 to 1,400 minutes, while women during their sexual life have a shorter time, 800 to 1,000 minutes, except during menstruation when it falls to about 600 minutes. Opinion is divided as to whether the intake of food alters the result or whether there are slight variations at different times of the day.

The Clinical Application of the Phenomenon

A considerable number of clinicians have applied the test to their services with the purpose of trying out its value as a diagnostic means. The results are extremely interesting and will occupy the remainder of this paper. As these articles on the clinical application of the test for the most part have been contributions from specialists dealing with their particular branch of medicine, we shall proceed to take them up in the same way.

Obstetrics and Gynaecology

As stated above the test was first advanced by Fahraeus as a diagnostic sign of pregnancy, but hopes for its use as such were more or less lost when it was found that marked acceleration of the corpuscle-sedimentation occurred during menstruation and especially in inflammatory conditions. Linzenmeier has applied the test to a large gynaecological service at Kiel, and he finds it particularly valuable in the differential diagnosis between ectopic gestation and disease of the adnexa. He uses the 18 mm. line as an end point and consequently his normal sinking time is less than that for the 24 mm. line which was given above. In a series of thirty-two extrauterine gestations, he found that in twenty sedimentation occurred between forty and ninety minutes in contrast to the normal time of between 180 and 300 minutes. In the cases where the time was less than forty minutes, there was a complication of some sort, as extreme intra-abdominal bleeding, secondary infection with abscess, or, as in one case where sedimentation occurred in the short time of ten minutes, it was found that criminal interference with a uterine syringe had preceded the tubal rupture. Where the time was over 100 minutes there were found old tubal moles with small peritubal haematoceles, which were aseptic and had partly healed. He cites an interesting case in which the history and findings spoke for haematocele while the sedimentation velocity was very fast. Puncture gave blood and the operator held the test as useless. Laparotomy, however, disclosed a very fresh acute pyosalpinx. The puncture needle had entered a vein. He maintains that all cases with suspicion of tubal pregnancy in which the sinking time is less than forty minutes, with the exception of severe intra-abdominal bleeding, may be looked upon as an acute inflammatory process.

This author, furthermore, sees great value in the test as a prognostic sign and indicator for time of interference in disease of the appendages. Sedimentation time under one hour gives uncertain outlook for germ-free inner genitalia, while less than one-half hour is a sure sign that still virulent bacteria are present in the adnexa or exudates. On the other hand, slow sinking speaks for a run-out process without virulent areas, which cause discomfort through topographico-anatomical changes and tugging by peritoneal adhesions.

Rudolf Pewny is the author of a more recent paper on the use of the test in gynaecology. He concludes that it serves as a means of differential diagnosis between gravidity and myoma only in the later months of pregnancy. One may use it to differentiate benign tumours without complications from malignant; haemorrhagic tumours of the adnexa from serous; chronic inflammations from acute; especially suppurative conditions and benign tumours, couched in the pouch of Douglas, from inflammatory exudates.

UROLOGY

Walther Pewny has applied the test to his urological service in Vienna, with interesting results. Acute and chronic urethritis give no increase of sedimentation velocity unless an acute prostatitis, epididymitis, cystitis or bartholinitis has been added. These complications, however, running a chronic course as also strictures and fistulae, give negative results. The positivity of the test in cystitis is proportional to its severity but independent of its etiology. In mild cases it is lacking. In tuberculosis of the bladder the test is negative in simple, non-ulcerating, tuberculous nodes, but there is more rapid precipitation if the disease has gone on to an ulcerating or spreading infiltrative condition. Cancers of the bladder give rapid sedimentation, as, unfortunately, do also benign papillomata where haemorrhage or cystitis is associated. Turning now to prostatism, we find negative results, *i.e.*, no acceleration of sedimentation velocity, in uncomplicated prostatic adenoma in the first or second stage, or beginning third stage; however, as soon as cystitis or haemorrhage complicates the condition, rapid sedimentation occurs. The rapidity of sinking in pyelitis is proportional to the severity of the inflammation and slows as the urine clears. Stone of the kidney or ureter and hydronephrosis give negative results if no inflammation or bleeding has occurred. The celerity of sedimentation in renal tuberculosis runs parallel to the extent of caseation and destruction of tissue. Hypernephroma gives positive, mobile kidney negative, tests.

Pewny therefore recommends the test for differential diagnosis of adenoma from carcinoma of the prostate, in renal calculus, hydronephrosis, and mobile kidney from hypernephroma, pyelitis and tuberculosis; furthermore, it is a good measure of the extent of tuberculous involvement of the kidney and is an index of the success of therapeutic procedures.

SURGERY

Loehr is the author of several contributions on the use of the test in surgical practice. First and quite extraordinary is the fact that sterile operations such as herniotomies, etc., show as a rule within twenty-four hours a considerable acceleration of the sedimentation velocity. This continues for about ten days, *i.e.*, to the completion of healing when it returns to normal. It occurs whether local or general anaesthesia is employed and bears no relation to the resorption temperature. As regards appendicitis, peritonitis, etc., the positivity of the test is proportional to the severity of the infection and also to the size of the area involved. Gall-stone disease gives a very rapid sedimentation which is present before icterus or fever occurs. It appears attributable to a harmful influence on the liver either through stasis of bile or associated cholangitis, rather than to the presence of bile in the blood. In diseases of joints the test is particularly useful in differentiating early tuberculosis where the reading is positive from osteochondritis, floating cartilages, old fractures, rachitic conditions, flat foot, etc., which give negative results. Simo found normal results in arthritis deformans. Fractures affect the sedimentation velocity in proportion to the size of the area involved. The test becomes positive within 24 hours and remains so until the break has become consolidated. Hyper- and hypothyroidism give normal readings. Unfortunately, as regards tumours in general the test is of little value as a diagnostic measure. True benign growths do not affect the sedimentation velocity, while malignant growths as a rule do, but this effect apparently bears no relation to the mere presence of immature proliferating cells in the body but rather to some secondary influence probably associated with cell disintegration and resorption of cell products, which generally, but not necessarily, are present. Furthermore, inflammatory conditions may give similar results. However, the test may be employed in differentiating cancer of the oesophagus from diverticula and cardiac spasm, and malignant conditions of the stomach from old chronic gastric ulcers. During anaphylactic shock the sedimentation is, curiously, much slower than normal.

MEDICINE

Many medical conditions have been included above. Frisch and Starlinger call attention to the fact that the test may be employed as an index of the extent and character of tuberculous areas in the lung, being relatively normal in a process associated with little tissue destruction. Sadlon has investigated the phenomenon in blood diseases and finds that the sedimentation in the acute stages of pernicious anaemia is considerably more rapid than in the secondary, or (better called) symptomatic, anaemias with equally low erythrocyte count. Moreover, in a case of polycythaemia with a count of 6,600,000 settling was fifteen times slower than the normal—a result which certainly is in no proportion to the increase in cells. He concludes that while the number of corpuscles influences the result to some extent, other factors, such as cell destruction, play the most important rôles.

CONCLUSIONS

We may conclude from the literature on this subject that the alteration of sedimentation velocity of the corpuscles of the blood is an expression of the effect of several influencing factors among which are changes in the number and size of the red cells, and even more important, in their tendency to autoagglutination. The latter factor is dependent upon variations in the colloidal composition of the plasma which alter the viscosity of the fluid and the electrical burden of the erythrocytes. The pathological conditions within the body which lead to these changes are very numerous, but in general seem more especially associated with processes in which tissue or cell disintegration occurs. The test is a very interesting example of the trend of modern medicine to express observations in definitely measurable results. As a diagnostic aid the reaction seems almost too general, and is, therefore to be regarded in the same light rather as fever, more the expression of a state than a characteristic test. On the other hand, if a clear conception of its fundamental nature is kept in mind, it can be employed often to substantiate other findings.

The Prevention of Certain Forms of Chronic Cardiac Valvular Disease.—In rheumatic endocarditis, the tendency of the inflamed valves is to heal; they may heal without deformity and there may remain no clinical evidence of previous disease, or the heart may remain enlarged as a result of the temporary incompetence of the valves. The permanent deformity of the cardiac valves in many cases of chronic valvular disease, according to Warren Coleman, New York, is probably due to recurrent attacks of endocarditis. Healing of the valves is promoted by keeping the patient in bed. This treatment should be maintained until after the disappearance of all constitutional symptoms.—*Jour. A. M.A.*, July 21, 1923.

Editorial

THE PREVENTION OF HEART DISEASE

IN harmony with the general trend of medical thought that "prevention is better than cure," it is encouraging and stimulating to see the advance which is taking place along the lines of preventative medicine in the treatment of cardio-vascular diseases.

As an indication of such tendencies there appears in the *British Medical Journal* of June 2nd, 1923, an article by Dr. F. John Poynton. To the best of our knowledge, in so much as the London centre is concerned, this is the first definite step towards the serious consideration of united effort on a question, which the author characterizes as the most practical in the whole range of heart disease—the possibilities of preventative measures. The movement is very opportune; for as the author points out, of recent years advances in the treatment of cardiac conditions have been comparatively few, therefore, it is essential that more attention be directed to preventative measures in their management. Excluding congenital heart afflictions, he states, the vast majority of heart conditions are associated with, or subsequent to, infections of various kinds, a fact which if more universally appreciated by the medical profession at large would greatly aid in diminishing the often disastrous effects upon the cardiac tissues. If, perchance, rheumatic and syphilitic infections could be eliminated, fully sixty-six per cent. of resulting disabled hearts would be prevented. At present much is being done for the prevention of the latter cause, but of the former as much cannot be said. Again an outstanding example is the often disastrous effects upon the heart of a tardy diagnosis of diphtheria and the administration of preventative serum.

That the whole question of prevention and care is of great national importance, witness the large percentage of rejections, on account of cardiac disease, which occurred in the U.S. Army draft during the Great War. The total rejections for crippled hearts were 42.3 per 1,000 or 4.2%. In other words, among five millions of men of military age, two hundred thousand were disqualified for service on account of heart disease. We may add to this the fact that in the U.S.A. registration area for 1920, the death rate for tuberculosis was 7.1%, whilst that for heart disease was 11.3%. In the past decade the death rate for tuberculosis has been reduced one-third by a nation-wide effort, while in the case of cardiac disease the surface has barely been scratched. Surely these figures speak for themselves. More striking still are the figures applying to the disease in children.

A report by the Department of Health of New York City covering 250,000 examinations made by medical school inspectors in 1918 revealed an incidence of heart defects among children of 1.6%. This would indicate that approximately twenty thousand school children of New York City show evidence of some cardiac disorder. Even if reasonable deductions are made from the above figures, could a more striking indictment be made against our present method? These and many other similar facts might be adduced to indicate the widespread incidence of cardiac disease. When we know that a great many disabling effects, if not the actual damage to the heart itself, might be prevented or at least arrested, then the question of prevention becomes of paramount importance.

The realization that our present methods of dealing with the problem involve enormous economic waste and immeasurable suffering, much of which is unnecessary and preventable, has led to the formation in New York of the Association for the Prevention and Relief of Heart Disease and the awakening of thought on this important question in Great Britain. The principles of the working plan of this Association have been the basis for the organization of similar associations throughout this continent. Now, if prevention is to be something of real practical use to the community, it must be applied at a time before either there exists a heart defect or before the result of a previous infection cripples the heart beyond redemption. In other words, prevention must be applied early in childhood. Our greatest hope for satisfactory results lies in this direction.

The public must be educated along broad lines of the usual causation, symptoms and results of cardiac defects; they must be taught the important rôle that infections play; the necessity of realizing that so-called "growing pains" are an evidence in the majority of cases of infection and most frequently of rheumatic fever; that this disease is an important factor in producing heart disease, and that convalescence therefrom must be slow. Cooperation between the parents and the physician is essential and as experience shows it is usually freely given.

Another very important avenue of attack must be through repeated careful medical inspection of all schools for the early recognition of infectious disease of all types with especial reference to chorea. This supervision must be intelligently seconded by the assistance of the school teacher who should be instructed along the proper lines of investigation. As an experiment the plan of segregating children with disabled hearts in separate schools has been tried in New York City. The handicapped child is thus removed from surroundings, where necessarily scant attention can be paid to his disabilities, to an environment of greater quietness and studied individual treatment, and where the hours of study and recreation and rest are carefully planned. This plan is open to obvious criticism but in general has yielded sufficiently encouraging results to warrant its wider adoption.

If a careful scrutiny be made of the record of any large general hospital, it will be found that a fair proportion of the admissions to the general medical wards is composed of chronic cardiac cases in all stages of decompensation. These patients make the rounds of the various hospital clinics, indoor and outdoor, and their records of admission frequently rise as high as six or sometimes eight. As their length of stay in hospital is longer than the average, the cost to the hospital, the economic loss to the community and the suffering, not only to the patient himself but to his dependents, is very considerable.

How can this loss and suffering be prevented or very much curtailed? Only by a properly supervised convalescence, best provided for in convalescent homes, where the ex-hospital patient, be he child or adult, can recuperate, build up his cardiac reserve by rest and supervised recreations, and eventually return to his community with his tolerance much improved—an asset rather than a liability.

A very important contributory factor to the return of these patients to hospital is the fact that "needs must when the devil drives"—they must earn a living, and in the absence of proper supervision and advice they return to their previous occupations, in many cases entirely unsuited to their limited reserve. These ex-hospital patients must be carefully supervised and classified; and through the associated social service be placed in occupations suitable to their ability and in a large measure be prevented from becoming a care to the State. As to the children, somewhat similar methods are used. Both ex-hospital patients and those attending the outdoor clinics are referred to special cardiac clinics, where regular examinations are made with especial reference to the eradication of possible seats of infection (*e.g.*, infected tonsils or teeth), also to alteration in character of exercise, diet, etc. The children are classified and enrolled into carefully supervised exercise classes; the principle kept constantly in mind that, although damaged, these young hearts can be educated up to greater limits of tolerance.

All this and much more can be done and is being accomplished through a well-nigh perfect organization in many of the larger cities of the United States. The present state of achievement has only been reached by a complete understanding between the general profession at large and the men at the head of this organization who have spared neither time nor energy in making it a success. In attaining these results, of primary importance has been the establishment of a central bureau of organization supervised by the medical committee but actually in charge of trained social service workers to whom much of the success of the movement is due. This aspect of the management of crippled hearts—preventative treatment—is rapidly gaining favour wherever the facts are squarely faced and a conscientious endeavour made to treat this class of patient in a logical manner. Prevention if possible, and, if the patients are crippled, building up of their limits of tolerance and enabling them to live within it should be the aims.

C. F. Moffatt

NEW PRINCIPLES IN BACTERIAL IMMUNITY

PROFESSOR Georges Dreyer of the Department of Pathology, in the University of Oxford, has recently published (*British Journal of Experimental Pathology*, London, 1923, IV, pp. 146-176) an account of experiments, the results of which already throw a flood of light upon certain problems of immunity and bid fair to do much more. A final opinion cannot yet be expressed but it seems most probable that a new method of treating tuberculosis and other bacterial diseases will be the outcome. Notices of Professor Dreyer's announcement have already appeared in the daily press and the *British Medical Journal* of June 23rd, 1923, gives a resumé of the address delivered at St. Mary's Hospital, London.

Starting with the knowledge that bacteriotherapy and serotherapy had not achieved results that are consistently good, Dreyer sought an explanation for this lack of uniformity. It is true that these methods have been of great benefit in the prevention of the enteric group infections and partial success has been attained with pneumococcal serum and staphylococcal vaccine. As Dreyer says, however, when the bacteria themselves (not soluble products like toxins) are concerned in the production of antisera or are used as vaccines, it is in the case of Gram-negative organisms mainly that success has been achieved. While if the organism concerned is acid-fast or Gram-positive, the results of treatment have not proved to have been very important, despite the extravagant claims which have been made in some quarters. To what then is acid-fastness or Gram-positiveness due? Certainly bacteria that show these qualities are rich in waxy or fatty substances, and it seemed possible to Dreyer that these "lipoidal" compounds protected the specific bacterial proteins and prevented them from being liberated in the body of the host. Thus the necessary stimulus being wanting, immunity reactions did not occur. Such a view of the differences in the chemical structure of bacteria finds support in the work of Douglas, who showed that he was able to digest the protein of Gram-negative bacteria with trypsin after extraction with acetone and he was able to produce immunity reactions. On the other hand, Gram-positive bacteria could not be digested with trypsin after treatment with acetone; or, if digestion appeared to take place, no immunity responses could be obtained.

After numerous experiments Dreyer has found that by treating tubercle bacilli with formalin and then with acetone he can produce a "defatted antigen". The bacilli become non-acid-fast but the bacterial residue is still capable of causing the production of immune substances, such as bacteriolysins, complement-fixing bodies, precipitins, and agglutinins. Gram-positive organisms, after the same manner, may be made to lose their Gram-positiveness and yet can be shown to possess antigenic properties. Dreyer gives in detail his method of defatting organisms but it is too technical to be written here. Again, a rather sensitive Gram-negative microorganism, *B. typhosus,* was selected and after similar treatment it was found to be still capable of bringing about the production of immune substances. Professor Dreyer has also been able to offer an explanation for the attenuation of anthrax cultures grown at 42° to 93° C.—a fact discovered by Pasteur. The Gram-positiveness is weakened or disappears as the normal "fatty" constituent is not formed at that temperature; these organisms, so grown, can be digested by the ferments of the body and an immunity response obtained. The same phenomena of attenuation has been shown by Dreyer for *Staphylococcus aureus.*

Some local reactions (infiltration and even necrosis) without general disturbances may occur at the site of inoculation with dead tubercle bacilli or staphylococci. Professor Dreyer has shown that such do not take place after injection with his "defatted" organisms; and further, he has proved that these local reactions are due to the "fatty" or lipoidal substances for the acetone extract injected alone produces them.

So far not many experiments have been performed on infected animals with "defatted" tubercle antigen. Guinea pigs were inoculated with tubercle bacilli of the human type. Such animals gradually lose weight, usually die within six to eight months, and show *post mortem* generalized tuberculosis of the spleen, liver, lungs, and lymph glands. On such animals treatment with the new antigen was instituted several months after the primary inoculation. An examination of the weight charts which show a rising curve, and Professor Dreyer's description of the decrease in size of the lymph nodes and spleen justify his conclusion that the "defatted" antigen "brings about a definite improvement, both general and local, in animals infected with *B. tuberculosis*....... Of course only time can show whether this beneficial effect is permanent. In order to attain certainty on this question, it will be necessary to watch the animals for a long period without further treatment, and then kill them and make a search for tuberculous lesions in their organs."

As no toxic effect showed itself in the animals, Professor Dreyer felt justified in having small doses given to human beings. At the London Hospital, since April last, Drs. Fildes and Western have been treating sixty cases of tuberculosis, (adenitis, cutaneous tuberculosis, pulmonary, joint and bone, peritonitis, tuberculosis of the urinary tract, irido-cyclitis and of epididymitis) which had already shown little improvement with tuberculin B.E. (Koch). These gentlemen report that—"Improvement has taken place in nearly all cases and is, in our opinion, of an order which exceeds obviously that obtainable by any other form of treatment which is applicable to these conditions."

It is welcome news to learn that the Medical Research Council in consultation with Professor Dreyer is making arrangements for an extensive trial of this new treatment in various parts of England. Once again we see proof that clinical medicine depends much for its advance upon the researches of the highly trained and skilled laboratory worker.

FATIGUE IN INDUSTRIES

THE publication of the third annual report[1] of the Industrial Fatigue Research Board focuses attention upon the thoroughness with which the study of fatigue in industries is being carried out in England. The importance of such investigations has long been recognized and while a certain amount of re-

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(1) *Third Annual Report of the Industrial Fatigue Research Board.* Medical Research Council, 1923.

search in fatigue has been conducted in a number of European countries, as well as on this continent, the work of the Industrial Fatigue Research Board occupies a unique position.

Replacing, toward the end of the Great War, the Health-of-Munition-Workers' Committee, which was organized in 1915, and cooperating with the National Institute of Industrial Psychology, which was founded in 1921 "for the application of psychology and physiology to Industry and Commerce," the Board has studied, in the laboratory, the effects of certain known causes of fatigue and, at the same time, has investigated, in the factory, the causes of certain known effects.

Among the general subjects of common interest that have been investigated by the Board may be mentioned "the optimum length of spell, accident causation, machine design, and sickness incidence and mortality."

As Lapp[2] has pointed out, "Under the modern industrial régime the working environment must be adjusted to the workers, and the workers themselves, so far as possible, must be adjusted to their employment." This obviously involves an intimate knowledge of man's physical equipment and the influences of modern industrial conditions upon the human organism. In this connection it may be of interest to note that there are many indications that man has so eased his struggle for existence as to halt the progress of natural evolution. While a great deal is known and more is being discovered about the effect of different stimuli on the organs and tissues that go to make up the human body, the fact remains that infinitely less is known about the reactions of the organism as a whole.

Lee[3] has recently called attention to the investigations of biologists in connection with the manifestations, causes, methods of detection and means of alleviating fatigue in industries, but, at the same time, has frankly admitted that definite amounts of chemical or physical change have not been correlated with specific amounts of work accomplished. In summarizing the situation he says, "I am inclined now to believe that there is nothing specific about the condition which, for convenience, we call fatigue; that it has no single, or even simple causative factors; but that the fatigued body is in a very different chemical, and perhaps physical, state from that of the unfatigued body, and that to restore the non-fatigued condition there are needed profound chemical, and perhaps physical, changes."

Frois and Caubert[4] have recently criticized the common tests for industrial fatigue, such as output curves, sickness curves, respiratory exchange of gases, etc., and maintain that the mechanical measurement of the energy required for a given operation is no criterion of the fatigue occasioned by it. Cathcart[5] believes that fatigue—which he defines as a diminished capacity for doing work—cannot be determined by any known quantitative test.

The concensus of opinion is that fatigue may arise in:

(1) The central nervous system,
(2) The muscular system,
(3) In both combined,

Fatigue may be subjective as experienced by the worker, or objective as noted in his actions and output[6]. But in industry, fatigue arises chiefly in the central nervous system[7].

Unfortunately, in most discussions of industrial fatigue a falling work curve or diminished output among employees who have not reported ill, is accepted as a complete uncomplicated reflection of fatigue. This, as Fisk[8] has pointed out, is wholly unjustified. He furthermore remarks, "From a thorough consideration of the literature, it is quite evident that a vast amount of emphasis has been laid upon the mechanical or extrinsic factors influencing the working capacity while the multiplicity of original physical and mental states that may limit the working capacity have been almost wholly neglected." In a survey of fatigue, he believes that it is first necessary to inquire: "Does the output fall because the worker is tired or because he is physically deficient?" "Is the worker ill because he is tired or tired because he is ill?"

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(2) *The Functions of Medicine in Industry.* John A. Lapp. *The Nation's Health,* November 15th, 1922.

(3) The Physiologist in Industry. Frederick S. Lee. *The Atlantic Monthly,* July, 1923.

(4) Studies in Industrial Physiology. *International Labour Review,* December, 1922.

(5) The Efficiency of Man. E. P. Cathcart. *Lancet,* September 9th, 1922.

(6) Waste in Industry. Chapter XV, *Health of Industrial Workers.* Eugene Lyman Fisk. McGraw-Hill Book Corporation, Inc., New York, 1921.

(7) Points in the Detection of Industrial Fatigue and Measures for its Possible Complete Elimination. Emery R. Hayhurst. *Journal of Industrial Hygiene,* November, 1920.

(8) See 6.

A gap in fatigue investigations which will be filled in the future will take into consideration the possible influence of sub-standard health conditions in the causation of fatigue and the separation of this influence from other factors and its evaluation. Furthermore, and notwithstanding the difficulties, there are indirect ways of demonstrating objectively the fatigue of the human body. As Lee has written, "the increasing complexity of the aids to analysis may be best indicated by a list of the varieties of apparatus arranged in chronological and neological order: kymograph, cinematograph, cyclegraph, stereocyclegraph, stereochronocyclegraph, and autostereochronocyclegraph." From a practical standpoint, it is the possible developments in the indirect methods of demonstrating fatigue objectively that are of particular interest to industry. Scientific knowledge, as such, does not have the same significance in business that it does in academic circles; but the results of scientific research that could be applied to industrial relations would immeasureably increase the already enormous debt of industry to science.

Past accomplishments in the investigation of the different aspects of fatigue in industries give great promise of future achievements. The difficulties to be overcome will only serve to supply added impetus to the search for the solution of the great problems that the subject presents. Intensive and coordinated investigations will be pushed forward both in the laboratory and in the factory. The results will be of fundamental importance to the conservation of the human resources of every industrial country as well as to the health and happiness of future generations. B. W. WYATT

Editorial Comment

ANIMAL PATHOLOGY AT CAMBRIDGE

THE Ministry of Agriculture and Fisheries has been far-sighted in offering to Cambridge University the sum of £30,000 to found a Professorship of Animal Pathology. The Professor when appointed will receive a stipend of £1,200 *per annum.* He will be eligible for reappointment at the end of five years. His headquarters will be at the School of Agriculture and the Ministry will consider estimates up to about £70,000 for the erection of a branch laboratory, animal houses, etc., and for the expenses of a staff and equipment for the period ending March, 1927. After that date the maintenance of the research Institutue will have to be provided for by Parliament or private benefaction.

Sir Clifford Allbutt, Regius Professor of Physic, at the University has urged time and again how important is the study of animal pathology. Such study will lead not only towards the prevention and treatment of diseases of cattle and other domestic animals with consequent great financial saving to the country, but it is certain that discoveries made in veterinary science are bound to help directly or indirectly in the prevention and treatment of disease in man. The close relations existing between animal and human pathology are fully realized by the Professor of Pathology at Johns Hopkins University and by others elsewhere. In the new pathological building in Baltimore, it is the intention to have men constantly working upon problems of disease in animals.

This new venture at Cambridge will be watched with keen interest. The department could not be more happily situated for it will be close to the new biochemical laboratory with Professor Hopkins as its head, close to Professor Langley's laboratory, to the Molteno Institute of Parasitology under Professor Nuttall, to the low temperature research station and, finally, close to the Medical School.

Abstracts from Current Literature

ERRATA

In the last paragraph of the abstract of an article "The Heart in Diphtheria" which appeared on page 529 of our last (July) issue for "antitoxin" read "toxin". As corrected the sentence should stand: "Some experimental work on guinea pigs showed that diphtheria toxin produced degenerative changes in the heart muscle of the same nature as those found in fatal human cases, but at no stage a definite inflammatory reaction".

MEDICINE

The Tentative Determination of Cardiac Reserve as a Therapeutic Index. Norman, T. *Med. Review of Reviews*, 1921, XXVII, 462.

The author points out that any estimation of the functional efficiency of the myocardium is purely tentative, and that the first judgment must always be based upon the subjective and objective condition of the patient. Before applying any tests, therefore, a careful examination of the subject with a view to exact diagnosis of morbid conditions must be made and a detailed investigation both into possible sources of infection and the history of past or present illness. After all possible information has been thus obtained, in order to minimize sources of error and to supply an aid in estimating the efficiency of the heart and circulation, certain tests may be resorted to. These he considers under three groups as follows:

Work tests are based upon the comparison of the three most important function rates in the body—pulse, respiration and blood pressure, recorded before and after exercise; in the case of each function rate the effort is made to determine (a) the immediate effects of exercise, (b) how soon reaction occurs after beginning the exercise, (c) the time interval before function rate returns to normal (cessation of reaction). The application of such tests to normal hearts and to those in which the cardiac reserve is lowered through various stages down to the point of actual decompensation, is considered and the technique of several is briefly reviewed. *The hopping test*, (much used in examining recruits), consists of hopping twenty paces on one foot and then noting the reaction. In *Selig's test*, the subject is made to climb a flight of twenty stairs, which should give a normal increase of twenty pulse beats; and six respirations to the minute, and a rise in systolic blood pressure of 8 mm.; (the systolic blood pressure rises after the pulse beat, and returns last to normal. In pathological states it may be delayed or diminished or may not rise at all). In *Schapiro's test*, the pulse is taken while the patient is in a recumbent position after lying completely relaxed for a few minutes and then on sitting up. It should increase three to ten beats per minute upon sitting up.

Energy index tests have been devised by which the effect of exercise may be numerically computed, in order to estimate the results of treatment, etc. The following are examples: In *Cabot's test*, stairs of a definite height are climbed; the amount of work done is computed in foot pounds by multiplying the height of the stairs by the patient's weight; if on the first application of this test the cardiac reserve is good, the height of the stair may be raised until the limit is reached, or it may be decreased in the same way to reach the point to which he is able to climb within his capacity. In *Barach's test*, the systolic blood pressure (considered as the energy factor of the heart) is added to the diastolic blood pressure (energy factor of the peripheral resistance), and the result is multiplied by the pulse rate per minute. This would give an energy index which may be compared with the normal index, according to the age and sex of the individual. In *Strassburger's test* the systolic and diastolic pressures are recorded and the pulse pressure is obtained from them. The pulse pressure divided by the systolic pressure and the result multiplied by the pulse gives the energy index, which normally ranges between thirty and thirty-five. In *Stone's test* the diastolic and systolic pressures are determined and the pulse pressure is then divided by the D.P. This should give a normal energy index of fifty.

Venous pressure tests have been devised. The simplest and most practical is that by Von Recklinghausen. The patient lies in a recumbent position, the left hand by his side on the bed, the right hand resting on his thigh, which is slightly lifted. The veins in the latter collapse, while those of the left hand (which occupies a lower position) swell out under a normal venous pressure; if the veins in both collapse the venous pressure is too low; if both fill out, the venous pressure is too high, indicating a decompensated heart.

Certain tests are useful as distinguishing between functional and organic heart conditions. The best known of these is *Aschner's oculocardiac reflex.* In this the patient is made to sit or lie down before counting the pulse. After this is taken he is instructed to close his eyes and relax completely, and then even pressure is applied over his eyeballs for thirty seconds or more; on removal of pressure the pulse rate is counted again. Normally the heart rate is slowed four to eight beats per minute; if slowed twelve to sixteen beats, or if accelerated, some disorder of the autonomic nervous system may be suspected. A second functional test is that of *irritation of the fifth nerve,* as by smelling salts; a normal heart is slowed and a nervous one accelerated. A third functional test, that of the *physiological use of atropin* in paralyzing the vagus, is described, but is not recommended, since seriously diseased hearts frequently react adquately or *vice versa.* M. E. A.

Oxygen Therapy in Premature Infants with Cyanosis. Baikwin, Harry. *Arch. of Pedr.*, 1923, 39, 677.

The author points out that cyanosis is frequent at birth in premature infants; that it is usually in such cases associated with atelectasis of the lungs, and that it is a grave symptom, requiring immediate treatment. He has found that oxygen therapy gives wonderful results, and recommends its administration to infants by means of a glass collar after the method in use at the New York Nursery and Child's Hospital.

In this method a rubber tube one-quarter inch in diameter with a hole in the end of it is inserted into the infant's mouth and held in place there by a glass collar which fits snugly over it and through which it has been passed. This collar is held in place by tapes which are passed through perforations in the ends of the collar and held behind the head; the glass collar prevents the child from closing his teeth over the rubber tube. Other methods of administering oxygen are described. The funnel method is absolutely useless, and Haldane demonstrated that ninety-eight per cent. of the oxygen was lost by it. The problem will not be adequately solved until an oxygen chamber is devised. The subject is most important since anoexaemia is such a serious condition. M. E. A.

Jaundice in Myocardial Insufficiency. Fishberg, A. M. *J.A.M.A.*, May 26, 1923.

Marked jaundice with yellow sclerae and bile pigments in the urine is not common in those with myocardial insufficiency, but a faint yellow or brownish-yellow pigmentation of the skin without bile pigments in the sclerae or urine is very common in such patients. It is difficult to determine the depth of the pigmentation in such patients owing to the accompanying cyanosis.

Fishberg has determined the amount of bilirubin in the blood of twenty-three patients with cardiac decompensation. He has come to the conclusion that an increase in the amount of bilirubin in the blood is very common in myocardial insufficiency and particularly in cases of long standing. This increase is more marked in cases of mitral than of aortic disease. Probably the greater venous stasis in the former group partly accounts for this. Investigation of the organs *port mortem* has shown that there is an increased destruction by the reticulo-endothelial cells of the red blood cells which stagnate in the viscera especially the lung, liver and spleen. Increased activity of the bone marrow compensates for this and even a polycythaemia may be brought about. Insufficient excretion of bile pigment by the injured liver cells also plays a part, but a minor one, producing an increase in amount of bilirubin in the blood. A. M.

Lessons to be Learned from the Results of Tonsillectomies in Adult Life: Observations in more than Three Hundred Cases. Alvarez, W. C. *J.A.M.A.*, May 26, 1923.

Very many of us must feel the difficulty in deciding whether we should advise certain patients to have their tonsils removed. The author, in the hope of acquiring some definite data to go upon, questioned all his patients who had had their tonsils removed. In the course of about two years 320 such patients consulted him. It might be objected that only those for whom tonsillectomy had failed to relieve certain symptoms came to the physician. Many, however, consulted him for some quite different trouble. Two hundred and fifty-one cases were carefully investigated and the results are very well tabulated.

This is a sober, thoughtful paper and too full of "meat" to quote from extensively. It should be widely read. All the patients were asked why they had consented to have the operation, what they had been promised, and what they had obtained by the operation. The author divides his patients into three classes. There were seventy-six patients who had had much tonsillitis; seventy-six per cent. showed a good result; twenty-four per cent. showed some improvement and amongst these latter are placed some patients who perhaps gained in weight besides having no further tonsillitis but failed to note any particular improvement in the special condition for which the tonsils were removed. In the second class are seventy-two patients who had had some tonsillitis and sore throat (but not frequently); thirty-one per cent. obtained a good result; forty-seven per cent. showed some improvement; and twenty-two per cent. noted no change. In the third class are placed 103 patients who had had practically no tonsillitis or sore throat; only three per cent. obtained a good result; sixteen per cent. showed some improvement; and eighty-two per cent received no benefit. It is not possible to take up in series the conditions given in the tables for which tonsillectomy was done but it is of interest to note that forty-seven patients had the operation performed for "rheumatism." Fourteen per cent. of these had a good result; ten per cent. showed some improvement; sixty-two per cent. showed no improvement; and nine per cent. were worse.

How often the operation is performed may be seen when the author found that one in every four of the patients who consulted him had had his tonsils removed. He writes: "although I have just been emphasizing some unfortunate phases of tonsillectomy, it must not be assumed that I have any antipathy to the operation, or that I fail to appreciate its value. I wish only to see its use restricted to those cases in which it is likely to do some good." He adds that during the period he himself advised the operation for sixteen patients and in spite of his conservatism, several of these patients are now in the list of those who got no result.

The author in one of his conclusions states that "tonsillectomy should not be done for the relief of troubles outside the throat until the patient has been studied very carefully by a competent internist. Few promises should be made if some chronic disease is found elsewhere in the body." ARCHIBALD MALLOCH

A Note on the Value of Symptoms in the Early Diagnosis of Pulmonary Tuberculosis. Munro, D. G. *Brit. Med. Jour.*, May 19, 1923.

It is recognized that the diagnosis of early pulmonary tuberculosis is being energetically taken up by the general practitioner. But there should be no relying on physical signs alone: both the clinical and anatomical factors must be constantly considered together.

The refinements in methods of physical examination have been very great. Inspection and palpation are receiving an attention that is perhaps somewhat belated. Lagging, especially at the apex, may outrun percussion and auscultation, in telling the tale of active disease, and much additional knowledge may be gained by light finger tip palpation, noting thereby the localized muscle spasm and trophic changes. Percussion must above all things be light, and other details of refinement have been developed. But it is no unfailing source of information. Some of the more special signs such as changes in Krönig's area of special resonance and the "bands of impairment" of Abrams are still, to say the least, not yet established beyond dispute.

The group of symptoms includes malaise, lassitude, nervous instability, digestive disturbances, tachycardia, fever and night sweats; fever and tachycardia are dealt with specially.

The importance of fever is quite beyond any question or minimizing. All the more, therefore, must it be recorded accurately. Oral temperatures require that the patient be not a mouth breather; that the thermometer be retained at least seven minutes; that there should not be recent exposure to cold wind, nor should it be soon after a hot meal. Again, the maximum temperature varies greatly in different people, and should be ascertained by two hourly observations. The first temperature should be taken before rising, as early as possible. Normal diurnal variation is about 1.5° F. If the record of temperature is to be as valuable as it can be, it should be continuous over three to four weeks. It shows, after all, the disturbance of a balance between heat production and heat dissipation by the toxaemia of the early tuberculosis: and this toxaemia is not necessarily a constant condition. There must be eliminated the slight average increase in chlorosis, the premenstrual rise, the highly strung temperament. The early morning temperature where a little above average is extremely significant. Also the slow decline of a rise after exercise or emotional disturbance. On the other hand, there is the possibility of pulmonary tuberculosis without fever.

Tachycardia is a frequent symptom—one author places it at ninety per cent. of early cases. Where the pulse is disproportionate to any febrile condition that may be noted or becomes unduly quickened on slight excitement or exertion, it may be regarded as a very reliable symptom of early tuberculosis.

Hyperthyroidism must always be ruled cut in this type of pulse. H. E. MacDermot

OBSTETRICS AND GYNAECOLOGY

Effects of Irradiation on Foetal Development Bailey, H., and Bagg, H. J. *Amer. Jour. of Obs. and Gyn.*, May, 1923, Vol. 5, p. 461.

Exposure of animals to radium or X-ray, before fertilization results in: (1) Arrested development of the foetus, particularly of the central nervous system, or if born alive, it dies shortly afterwards. (2) Early sterility of subject. (3) Hereditary defects and abnormalities in the central nervous system or eyes.

Exposure after fertilization results in: (1) Death of embryo, with abortion or absorption. (2) Birth of monsters. Exposure to X-rays for diagnosis during pregnancy caused no ill effect to mother or child. For the treatment of pathological conditions irradiation is contraindicated as it may produce death and abortion of foetus, or if born, its physique and life are impaired. Late in pregnancy, premature birth, with early death of child results. Before conception, irradiation often results in sterility or still-birth at term.

Radium is liable to cause sterility or amenorrhoea. It should be used only in a few selected cases of menorrhagia, for while symptoms are relieved, partially damaged ovarian follicles may remain, capable of producing premature children, monsters, or physically or mentally defective offspring. A. D. Campbell

Routine Treatment for Hyperemesis Gravidarum. Speidel, E. *Amer. Jour. of Obs. and Gyn.*, May, 1923, Vol. 5, p. 481.

Laboratory tests aid but little, though according to Titus and Givens there is a carbohydrate deficiency in the mother owing to the demand for carbohydrate in the foetus. The determination of this would necessitate complicated laboratory methods. The ammonia coefficient is of little aid as it indicates the manifestation of acidosis; starvation being responsible for such acidosis. The same applies to various other tests, *e.g.*, for diacetic acid and for acetonuria. Clinical manifestations of rapid pulse, pyrexia, jaundice and coffee-grounds vomiting appear too late for other than operative treatment to be of much avail.

The liver of the foetus after the third month relieves the maternal liver of its metabolic functions and the expectant treatment should be employed until after such time is passed.

The writer employs a routine treatment when vomiting persists after the third month of gestation.

General: (1) Co-operation of family. (2) Hospitalization—either by removal to an institution or converting home into hospital. (3) The room should be flooded with sunlight. (4) The patient should wear smoked glasses. (5) The administration of food (even water) by mouth, stopped.

Daily Routine begins 7.00 a.m. Irrigation of bowels with warm water containing 2-3 oz. of sod. bicarb. to gallon.

Feeding: Glucose, 50 grammes; Trophonine or parapeptone, 100 cc.; Sod. bicarb., 20 grammes; Aqua ad q.s., 1,000 cc. Divided into four feedings of 250 cc. each, given at 8.00 a.m., 12.00 a.m., 4.00 p.m., and 8.00 p.m., by rectal catheter No. 12.

Drugs: Sod. bromide, 60 gr., and if patient be restless 30 grains chloral are added to vital feedings, gradually reducing drugs as patient improves. Corpus luteum intramuscularly b.i.d. *Third day*—500 cc. sterile (carefully filtered) 10% glucose solution intravenously, administration lasting half an hour. This is contraindicated in cases of glycosuria. *Fourth and fifth days*—rectal treatments continued. *Sixth day*—glucose intravenously. *Eighth day*—gastric lavage. *Ninth day*—little dry food; rusk or shredded biscuit by mouth. If patient vomits after above routine, then pregnancy should be interrupted.

In the discussion which followed the paper one speaker agreed that with increasing severity of clinical symptoms pregnancy should be interrupted. The time is the question. Another stressed the administration of fluids but stated that the appearance of haemorrhage either in the form of coffee-ground vomitus or from the uterus should be taken as a sign for intervention. The creatinin content was a very dependable index for prognosis in the opinion of another speaker. He recommended 300 cc. blood transfusion. Another physician stated that if the creatinin content is on the increase in nephritics, it is not so dangerous as in the non-nephritic patient. A woman who has lost one-sixth of her weight as a result of vomiting in pregnancy is in danger. He recommended giving the patient any food she desired provided liquids were restricted. A. D. Campbell

News Items

GENERAL NEWS

Dr. T. Clarence Routley, General Secretary of the Canadian Medical Association, represented that Association at the American Medical Convention at Los Angeles. He returns *via* the Canadian Rockies to attend medical meetings in Victoria, Vancouver, Calgary, Saskatoon and Winnipeg.

Dr. F. W. Marlow is leaving for Victoria, B.C., where he will be joined by Dr. F. Tees, of Montreal, and Dr. T. C. Routley, of Toronto. Beginning at Victoria on July 3rd, under the auspices of the Canadian Medical Association, they will address the local medical societies at Victoria, Vancouver, Calgary, Edmonton, Saskatoon, Regina, Winnipeg, and Port Arthur, and will conclude their journey about July 20th. The main subject of Dr. Marlow's addresses will be, "Symptomatology of female pelvic disease," but he will also take the opportunity of getting the views of western medical men on the subject of post-graduate work in medicine and surgery. Dr. Tees will deal mainly with the subject of "Fractures," while Dr. Routley will discuss matters pertaining to the furtherance of the organization and consolidation of the Canadian Medical Association, with which body the various provincial medical associations are affiliated. It is noteworthy that this is the first tour of its kind that has been undertaken in Canada.

NOVA SCOTIA

Two of the buildings for the Medical Faculty of Dalhousie University, provided out of the munificent gift of the Rockefeller and Carnegie Foundations, are rapidly approaching completion. One of these, the Medical Sciences Building, which houses physiology, biochemistry, pharmacology, and hygiene, will be completed in time for the opening of the session. It is a beautiful structure, in variegated brick, fireproof throughout, and finished in every detail in a very tasteful and suitable manner. The second, the Public Health Clinic, is not so far on in construction, but should be finished early in the New Year. This structure is an out-patient department, and will also take care of the several public health activities of the province. It, also, is very complete, and will be of very great value both to students and practitioners. Plans are also practically completed by the Provincial Government for the much-needed addition to the Pathological Institute, and its construction will shortly be actively pushed. Dr. Nicholls, the Professor of Pathology and Provincial Pathologist, together with Mr. W. W. Kenney, the Superintendent of the Victoria General Hospital, were recently in Montreal, looking over the new McGill Pathology Building and the Laboratory of the Montreal General Hospital, gathering special information. This new laboratory will be a pressed brick structure, one hundred and five feet long, by sixty feet wide, three stories high. It will take care of the needs of the University classes in pathology, the public health laboratory work of the province, and the special work of the Victoria General Hospital. These three buildings, when completed, will enable the University to carry on these special lines of instruction much more fully and conveniently, and will provide accommodation for the new professors, who are to be appointed, it is expected, in the near future.

A very important and interesting suggestion has recently been brought to the notice of the Medical Faculty of Dalhousie University, looking towards the establishing of a summer school in Medicine. It is felt by some that such a scheme would be workable, and would fill the proverbial "long-felt want." Halifax is an ideal summer city. The temperature is rarely above eighty degrees, and the nights are always cool. Then, the outdoor attractions are great. Fishing, sailing, motoring, and golf can be indulged in to one's heart's content. Some members of the medical fraternity are in the habit of spending the holiday season in the Maritime Provinces. Perhaps such, together with others, might be induced to come to Halifax for a month, giving a few lectures or clinics, and spending the balance of the time in relaxation. Probably, the bulk of the teaching would be done by the local men, but members of the teaching staffs of other universities, and distinguished visitors, would, it is hoped, take part. It is not intended that this should be a Dalhousie affair, but all Canadian universities could in time be included. It is an all-Canadian scheme, by Canadians, and for Canadians. Nor need the plan stop with medical instruction. The Faculties of Arts, Law, Dentistry, Agriculture, and Music, might in time be included. Thus, a very big thing may develop out of small beginnings. The idea, at least, is alluring.

The Seventeenth Annual Meeting of the Nova Scotia Medical Society was held in Windsor, N.S., on the 3rd, 4th, and 5th days of July. Dr. David Cheever, of Boston, was in attendance and gave several interesting addresses. Papers read by local men were as follows: "The Cancer Problem," by Dr. John Stewart, Halifax; "Spinal Surgery," by Dr. A. R. Campbell, Yarmouth; "A Plea for the Standardization and Advancement of X-rays in Nova Scotia," by Dr. W. H. Eagar, Halifax; "A few remarks on Preventive Medicine and Life Saving," by Dr. J. B. Black; "Clinical Value of D'Espine's Sign," by Dr. T. M. Sieniewicz, Halifax; "Mental Hygiene," by Dr. F. E. Lawlow, Halifax; "Systemic Infections, Their Relation to Nutrition in Infants. Otitis Media Case Report," by Dr. Gordon B. Wiswell, Halifax; "Insulin," by Dr. K. A. MacKenzie, Halifax; "Some Present Day Methods of Investigation in certain Kidney and Bladder Conditions" illustrated with lantern slides, by Dr. F. G. Mack, Halifax; "Diagnosis of Diseases of the Gastro-Intestinal Tract particularly from a Roentgenological Standpoint," by Dr. S. R. Johnson, Halifax.

It is of considerable interest to note that the Society placed itself on record as favouring a Ministry of Health.

Officers elected for the ensuing year are as follows: *President*, Dr. O. B. Keddy, Windsor; *1st Vice-President*, Dr. W. N. Rehfuss, Bridgewater; *2nd Vice-President*, Dr. J. J. Roy, Sydney; *Secretary-Treasurer*, Dr. J. G. D. Campbell, Halifax; *Associate Secretary*, Dr. S. L. Walker, Halifax.

The Association of Medical Health Officers of the Province met on the day preceding the Medical Society.

The Fourth class to complete the Course in Public Health Nursing were graduated from Dalhousie University on Friday, July 13th, at a special Convocation held in the Medical Building. The address on this occasion was given by Dr. B. Franklin Royer, who has been director of the course since its inauguration. Dr. Royer and Miss Ross, who has been the assistant director, now retire from these positions in favour of the newly established Department of Health in the University, over which Dr. Hattie will preside in his capacity as full-time Professor of Public Health.

The work of the public health nurses and visiting house-keepers of the Massachusetts-Halifax Health Commission covered a total of thirty-two hundred and forty instructional visits during the month of June, in a total of twenty hundred and thirty-six families. Medical and nursing advice sought at the various health centre clinics reached some twenty-one hundred and fifty families, most of whom were given only sensible advice in rearing their children.

The "clinical week," which was so much appreciated last year, is to be repeated this September, beginning on the sixth day of the month. It will follow the lines of the previous effort, and will doubtless be as well attended. The committee in charge of the matter have felt much encouraged by the splendid attendance of the medical men of the province. The "Week" promises to be a live issue in this part of Eastern Canada.

QUEBEC

COURSE OF INSTRUCTION IN THE TREATMENT OF DIABETES WITH INSULIN

The Montreal General Hospital has arranged a course of instruction in the treatment of diabetes mellitus with insulin. The course was first announced to the physicians practising in the city of Montreal. Since its inception 142 physicians have received instruction. The course is now being extended free of charge to any physician resident in the Province of Quebec.

To restrict the use of insulin to hospital practice would be very unfortunate for the many diabetics not treated in hospitals and would unnecessarily limit the application of so valuable a therapeutic agent.

It cannot be too strongly emphasized that one treating a diabetic with insulin must have knowledge of the principles governing the physiology and pathology of the disease. The Toronto group of workers have repeatedly emphasized the fact that when improperly employed, insulin may be a dangerous remedy.

As in the use of any other therapeutic agent there are indications and contra-indications to the use of insulin. Experience has demonstrated the important fact that those general principles underlying the treatment of diabetes without insulin apply equally to the treatment of diabetes with insulin.

The course consists of four periods given on four consecutive days. Briefly, the following are given consideration:

Period I.—(*a*) Experimental production and control of diabetes; (*b*) Metabolism: (1) General; (2) Acidosis; (*c*) Newer studies governing hyperglycaemia and glycosuria.

Period II.—(*a*) Clinical application of experimental work; (*b*) Fundamental principles concerning dietetic treatment; (*c*) Practical demonstrations in the use of modern methods of dietetic treatment.

Period III.—(Insulin)—(*a*) Physiological effects of insulin; (*b*) Practical application of the physiological principles in treatment; (*c*) General rules for treatment: (1) Indications and contraindications; (2) Dosage; (3) Observation of progress of patient; (4) Treatment of coma.

Period IV.—Practical method for the estimation of blood sugar.

The course is being given by Dr. I. M. Rabinowitch of the Department of Metabolism. Application for attendance should be made to Dr. A. K. Haywood, Superintendent, Montreal General Hospital.

Since only a limited number can attend at one time, each applicant will be notified of the dates assigned him.

At the 16th Regular Meeting of the Medico-Chirurgical Society the following were elected officers of the Society: *President*, E. W. Archibald; *Vice-President*, S. Hanford McKee; *Treasurer*, D. Grant Campbell; *Secretary*, F. H. Mackay; *Trustee*, Kenneth Cameron.

ONTARIO

On June 6th, the Stormont and Glengarry Medical Society met at Alexandria. Dr. H. S. Hutchison, of Toronto, spoke on "The Modern Treatment of Nephritis."

On June 7th, the Perth County Medical Society met at Stratford; at the meeting an address was given by Dr. Geo. Ramsay, of London, on "Fractures."

The Victoria County Medical Society met in Lindsay on June 8th. Dr. Wm. Goldie, of Toronto, spoke on "The Etiology, Diagnosis, and Medical Treatment of Gastric and Duodenal Ulcer."

A meeting of the Brant County Medical Society was held in Brantford on June 14th. Dr. John Oille, of Toronto, spoke on "The Diagnosis, Prognosis and Treatment of Cardiac Irregularities."

On June 14th, the Perth County Medical Society met in Stratford; Dr. E. G. Young, of London, delivered an address on "Basal Metabolism."

The South Simcoe Medical Society held a meeting in the House of Refuge, Beeton, on June 19th; Dr. G. A McLarty, of Toronto, discussed "Psychiatry from the Standpoint of the General Practitioner."

A meeting of the Grey County Medical Society took place at Owen Sound on June 20th; Dr. Roscoe Graham, of Toronto, spoke on "The importance of the history and clinical examination in acute abdominal conditions."

Dr. C. S. Wright addressed a meeting of the Hastings County Medical Society, at Tweed on June 20th, taking as his subject, "Some explanations of low back pain with consideration of sacro lumbar and sacro iliac lesions."

On June 21st, the South Waterloo Medical Society met at Galt; an address was given by Dr. Donald M. Low of Toronto, on "Uterine Haemorrhage."

The Bruce County Medical Society met at Wiarton on June 21st; Dr. W. W. Lailey, of Toronto, delivered an address on "Modern Views on the Toxaemias of Pregnancy."

On June 26th, the Norfolk County Medical Society met at Simcoe; Dr. Perry Goldsmith, of Toronto, discussed, "The management of some common complaints among oto-laryngological patients."

On June 27th, the Ontario County Medical Society met at Whitby; two addresses were given, one by Dr. D. E. Robertson, of Toronto, on "Acute Abdominal Conditions of Childhood", and one by Dr. W. A. Scott, of Toronto, on "The Use and Abuse of Forceps."

Dr. K. C. McIlwraith, of Toronto, addressed the Perth County Medical Society in Stratford on June 28th, taking as his subject, "Modern Views of the Conduct of Labour."

Dr. F. G. Banting and Mr. C. H. Best were awarded the Reeve prize in the Faculty of Medicine of the University of Toronto. Dr. Banting also received the Charles Mickle Fellowship.

A meeting of the Victoria County Medical Society was held at Lindsay, on July 6th, which was addressed by Dr. J. Oille, of Toronto, on "Rheumatic Fever and Endocarditis."

At the annual meeting of the Council of the College of Physicians and Surgeons of Ontario, Dr. E. T. Kellam, of Niagara Falls, was elected president, and Dr. G. R Cruickshank, of Windsor, vice-president.

The annual meeting of the Simcoe County Medical Association was held in Barrie, on July 6th, at the Royal Victoria Hospital. Papers were presented by Dr. Kendall, of Muskoka Hospital for Consumptives, Dr. Bunt, of Everett, Dr. Simpson, of Collingwood, and Dr. Ross, of Barrie. Dr. W. J. Scott, of Cookstown, was elected as president.

A new County association has been formed in Ontario under the presidency of Dr. R. C. Channonhouse, of Richmond, known as "The County of Carleton Medical Association." The Secretary-Treasurer is Dr. A. B. Hyndman, of Carp. The new Association held its first spring session on May 16th, at Richmond, Ont., when Dr. William Hutchinson, of Ottawa, gave an address and clinical talk on the subject of "Tuberculosis of the Kidneys and Common Diseases of the Prostate." The next meeting will be held the latter part of August. The subject of "Intestinal Diseases of Children" will be taken up and a paper read by an authority on the subject.

The first two meetings of the Peel County Medical Society were held on July 5th and July 13th at Brampton, the following programmes were presented: *Thursday, July 5th, 1923*—1.00, Registration of Members; 1.15, Presentation of Clinical and Pathological Specimens; 1.30, President's Address; 2.00, Dr. Fred Spearing, Beeton, Subject, "Diagnosis and Treatment of Puerperal Eclampsia."; 3.00, Dr. Wm. Goldie, Toronto, Subject, "The Etiology, Diagnosis and Medical Treatment of Gastric and Duodenal Ulcer." *Friday, July 13th, 1923*—2.00, Dr. A. J. Grant, London, Subject, "Office Treatment of Haemorrhoids and Kindred Conditions under Local Anaesthesia "; 3.00, Dr. Thomas, Caledon, Subject, "Ten Years' Experience in Obstetrical Work in Rural Practice."; 4.00, Dr. K. F. Rogers, Beeton, Subject, "Some Aspects of Tuberculosis in Infancy and Early Childhood."

ALBERTA

Physicians from various points in southern Alberta had the privilege of attending at Calgary on July 9th and 10th, interesting and instructive lectures and clinics by Dr. F. W. Marlow, associate Professor of Gynaecology, Toronto University, and by Dr. F. J. Tees, lecturer in clinical surgery, McGill University. They also heard Dr. T. C. Routley, who spoke on behalf of the Canadian Medical Association, of which he is the General Secretary. Clinics were held in the Holy Cross and General Hospitals by Dr. Tees, where ample clinical material was available. His demonstrations and lectures covered a wide range of various types of fractures, with the application of present day methods of treatment, in marked contrast to those of pre-war times.

Professor F. W. Marlow gave three lectures dealing with the types and symptomatology of pelvic inflammation in women, also with the operative treatment of uterine displacements. He covered the ground most thoroughly and dealt chiefly with points of the most practical importance. There was a large attendance and it was the unanimous opinion that these meetings should be held annually when we would have the pleasure of listening to two or more clinicians from eastern Canada.

Following the lectures of Professor Marlow and Dr. Tees, Dr. Routley gave an address on "The aims and objects of the Canadian Medical Association." He made a strong appeal to the physicians of Alberta to stand behind and support this Association as a national organization; at no time in the history of Canadian medicine did we need unity and coordination of purpose as at present. Those present heartily endorsed those views. Undoubtedly meetings such as these, held in different centres of each province throughout Canada will do much to solidify and weld the component parts of the Canadian Medical Association.

Obituary

Dr. C. J. Parsons of Sharbot Lake, died on June 15h, in his seventy-fifth year.

Dr. Samuel Mitchell a graduate of the University of Toronto, died at Mapleton on June 14th, in his sixty-fifth year.

Dr. William Cuthbertson a graduate of Victoria College and Toronto University, died in Chicago on June 18th.

Dr. George Arthur Winters of Montreal, died suddenly in Toronto, on July 3rd. He was a graduate of the University of Toronto in 1901, and practiced for some time in that city. He went to study in England, in 1913, and at the outbreak of war returned to Canada and served in the Canadian Army Medical Corps in this country and in Siberia. At the time of his death, Dr. Winters was chief Surgeon to the Bell Telephone Co. of Canada. He was forty-six years of age, and is survived by a wife and three children.

Book Reviews

Charles White of Manchester (1728-1813) **and the arrest of Puerperal Fever** being the Lloyd Roberts Lecture, Manchester Royal Infirmary, 1921. By J. George Adami, C.B.E., M.D., F.R.S., Vice-Chancellor of the University of Liverpool, with which are reprinted Charles White's published writings upon Puerperal Fever. pp. 142. Price, 5s. net. The University Press of Liverpool, Ltd., and Hodder & Stoughton, Ltd., London, 1922.

This work, which is the first Lloyd Roberts lecture at Manchester Royal Infirmary, originally appeared in the *Journal of Obstetrics and Gynaecology of the British Empire.*

Charles White, a friend and fellow-student of John Hunter, a competent surgeon and the virtual creator of Manchester Royal Infirmary, was—as the author claims and demonstrates—also a pioneer of British obstetrics. In his *Treatise* on the management of pregnant and lying-in women, which appeared in 1773, White prescribed methods for the prevention of puerperal fever which still hold the field to-day with little modification. He urged the importance of absolute cleanliness, of fresh air, and of an upright, or not wholly recumbent, posture for women after childbirth.

The author lays special stress on the fact that White's *Treatise* preceded by eighty-seven years the *Aetiologie* of I. P. Semmelweis, which was published in 1860. He maintains that what is most significant in the teaching of the Hungarian physician had already been covered by the English *Treatise,* on the doctrines of which it was largely founded. To Semmelweis, however, belongs the credit of showing that the main cause of the incidence of puerperal fever in the Vienna lying-in hospitals was the practice of allowing students, coming straight from the post-mortem room, to examine the patients without first adequately cleansing their hands. Semmelweis regarded the disease as "uebertragbar" or conveyable, while White held it to be a contagion. This, as the author pertinently remarks, is a distinction without a difference. Be that as it may, White's claim to priority, in the essentials, appears to be indisputable.

This work may be cordially recommended. Its style is vigorous and its arrangement lucid. It states White's views clearly, testing them by comparison with modern teaching. The reprint of his writings, which forms the second part of the volume, affords justification, if that were necessary, for the author's contentions on his behalf.

J. R. C.

Official History of the War—Medical Services—Vols I and II; Hygiene of the War—Based on Official Documents—Edited by Major-General Sir W. J. Macpherson, K.C.M.G., C.B., LL.D.; Colonel Sir W. H. Horrocks, K.C.M.G., C.B., and Major-General W. W. O. Beveridge, C.B., C.B.E., D.S.O., K.H.P. London: His Majesty's Stationery Office. Per vol. 1 guinea.

Following the English use of the term hygiene, these two volumes deal with "the practical measures which were adopted for the prevention of disease"; and, again following English traditions, prophylactic vaccines are considered as belonging "more to the domain of bacteriology and pathology than hygiene," while sanitation is considered as relating chiefly to purification of water and disposal of waste, soil pollution, etc. As a result of this nomenclature, the classification of the subjects treated seems rather lame and illogical on this side of the water, but the material itself is readable and good. As features of the report may be stated the aid given in locating deep water supplies during the British advance from Egypt into Palestine by geological studies; incineration as the best method of disposal not only of ordinary dry waste but also of manure and even of human excreta; disinfestation of clothing affected by lice, etc., important because of the transmission by lice of typhus and trench fever; the soldier's ration, clothing and equipment, now brought to a high point of simplicity and efficiency; analyses of all the common foodstuffs; researches on food deficiency diseases and on control of infectious diseases; the use of mobile laboratories for diagnosis, care of water supplies, tests for poisons, etc., a special laboratory for physical tests relating to the work and equipment of the soldier; correlation of the engineering and medical services in construction of hospitals, huts, water supply erections, etc., the establishment of schools of sanitation, to provide trained personnel for the care of the health of the troops; the impressing of combatant officers both in high and subordinate commands with the importance of public health work; and other very human and practical points.

All this led to the establishment of 0.3% of strength as the permissible limit of inefficiency due to sickness, in an army in the field. So well established did this figure become, that an admission-rate higher than this was a danger-signal, announcing something wrong in the care exercised against disease.

Expanded from the R.A.M.C. sanitary units, the trained sanitary personnel in France by the end of 1917 reached 2,500 men, and at the time of the Armistice 17,000 persons were employed on sanitary duties in the various war areas. At first each unit provided its own sanitary arrangements; but owing to the rapid movements of troops through the same areas, it was found much better to establish fixed sanitary areas with each its own personnel. Units moving through these areas thus found everything ready for them when they arrived and left everything in good hands when they passed on. The tendency to push off on the sanitary personnel all sorts of odd jobs, even to running moving-picture shows, is commented on and reminds one forcibly of how much human nature there is in man, even when he becomes a soldier—for in civilian public health this is just one of the many drawbacks from which public health service has suffered—the loading-down of public health officials with every sort of job, whether it related to the prevention of disease or not. Even in Ontario, within a year, inspection of cemeteries was thrust upon the Provincial Board of Health!

Specific reference to Canadian contributions is rare. On page 19 (Vol. I) it is noted that segregation of measles contacts on a large scale was abandoned in favour of the (Canadian) plan of daily inspection of contacts otherwise free; page 276 of the same volume notes that No. 10 Stationary Hospital (Canadian, from the University of Western Ontario) was the first to adopt a Hospital plan which afterwards was found very generally useful. Page 239 of Vol. II mentions very briefly the bacteriological work of Lieut-Colonel Nasmith (of Toronto). Dr. John Amyot; Sanitary Advisor to the Canadian Army is not mentioned at all, although the appointment of a "Mr. Cameron" at Brentford, England, as a local chemist is mentioned in the text and listed in the index!

The first four chapters (132 pages) of the 2nd volume deal with food and contain much valuable information on energy requirements, food deficiencies, etc. Laboratories, prevention of cerebro-spinal meningitis, prevention of flies, lice, scabies, bilharzia, smallpox, plague, etc., are then dealt with at length. Appendices deal with report forms, and also with the prevention of chilled feet and frostbite, trench foot, etc.

Altogether these two volumes give a great mass of information, much of which is valuable to the civilian practitioner and health officer.

H. W. H.

Pregnancy, Lactation and Diet

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pp. 70 and 100. Report of Joint Committee of Lister Institute and Medical Research Committee on "Accessory Food Factors (Vitamins)." H.M. Stationery Office.

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The Form and Functions of The Central Nervous System—An introduction to the study of Nervous Diseases. By Frederick Tilney, M.D., Ph.D., and Henry Alsop Riley, A.M., M.D. Publisher: Paul B. Hoeber, New York.

This book of over a thousand pages is the best introduction to the study of nervous diseases that has ever appeared, and this second edition is in many ways improved. The careful description of the anatomy that is given for each part of the nervous system, including the spinal cord, medulla, pons, midbrain, cerebellum, interbrain, and endbrain is written concisely and well illustrated so that the beginner can refer from text to photograph with ease. Following the anatomy, the histology is taken up in the same manner, and this is finally followed by a full description of the physiological value of the part under consideration.

Finally, each section is completed by a chapter on questions which are met with by the practising physician, namely, the various syndromes that are recognized as characteristic of the area under discussion. This final series of chapters is invaluable, as it is of the greatest assistance to the physician and to the neurologist in making a diagnosis on the data that he may have concerning the case he has under investigation.

No physician's library is complete without a copy of this splendid work and one cannot speak too highly of the great care that the authors have taken in obtaining the latest information from every field, and the manner in which they have placed the latest facts that are known in the department of the nervous system, so that the busy physician can rapidly ascertain the location of the disease he is studying and at the same time master the most recent facts about the functional conditions associated with it. G. W. H.

La Guérison de la Tuberculose Pulmonaire. By Dr. R. Burnand, Medical Director of the Sanatorium populaire de Leysin. 198 pages, paper bound. Paris, 1923: J. B. Bailliere et fils. Price, 6 francs.

This is not primarily a work on treatment, though the principles of treatment are discussed as well as the effects of treatment. It is rather an essay upon the forms of tuberculosis, following the classification of Bard, the method of progression of the disease in the lungs, the methods of studying and diagnosing the stages of the disease, and the means of determining the results of treatment, with the measure of cure whether relative or absolute.

The first part of the work is introductory. In this Bard's classification of the clinical forms of pulmonary tuberculosis is discussed, the natural evolution of tuberculosis, its curability, and the definition of cure. The second part deals with the processes involved in anatomical cure, followed by the clinical observations necessary to estimate the extent, character and activity or quiescence of the lesions. The effect of climate, rest and exercise and of medicinal therapy are briefly discussed.

It is a very readable presentation of the subject, a clinical monograph on a particular phase of tuberculosis which will well repay perusal by the general practitioner as well as by those who are dealing more particularly with tuberculosis. J. H. E.

Injury, Recovery and Death, in Relation to Conductivity and Permeability. By W. J. V. Osterhout. In Monographs on Experimental Biology. J. B. Lippincott Co., $2.50 net.

In this monograph of 236 pages, Professor Osterhout has written a connected account of his research on the electrical conductivity of protoplasm under varying environments. The author, with wonderful skill, has been able to demonstrate that the method he uses, not only gives a correct measure of the conductivity of the protoplasm itself but also that this conductivity runs parallel to and may be used as a measure of the permeability of tissues.

It is well known that the permeability of tissues increases at death. The method, therefore, becomes available for the measurement of the death point of the tissue and also for the intermediate stages of injury as well as of recovery from injury. He has demonstrated, in other words, that the electrical resistance of plant and animal tissues may be used as a measure of vitality.

The method naturally lends itself also to the investigation of the phenomena of antagonism and anaesthesia and there is an extensive discussion of the results obtained in these fields. The author, already a master of chemical and microscopical methods of measuring permeability and antagonistic salt action, has been able to confirm and extend his previous observations made with these methods, and confirms also those of other workers in this field.

The mathematical aspects of the method are very simply and clearly explained. The conductivity of protoplasm as pointed out in the introduction and as later demonstrated, is one more of those methods leading biology in the direction of the exact sciences and it supplies one more link in the chain of evidence tending to show that living matter obeys the laws of physics and chemistry.

The book contains sixteen pages of bibliography and an excellent index. H. W.

Smell, Taste, and the Allied Senses in the Vertebrate. By G. H. Parker, Sc.D., Professor of Zoölogy, Harvard University. 192 pp., 37 illustrations. Price, $2.50. J. B. Lippincott Company, Philadelphia and London.

This volume, which is one of the series of monographs on Experimental Biology, edited by Jacques Loeb, T. H. Morgan and W. J. V. Osterhout, deals with a group of sense organs which has been rather neglected. The eye and the ear have occupied the attention of the majority of investigators in the field of sensory physiology, nevertheless the sense of smell, taste, and the "common chemical sense" are equally worthy of consideration. Although the book has been written with the idea of comparing these senses in the different classes of vertebrates, by far the greater number of pages has been devoted to the human subject. It, therefore, has a wider appeal than to the so-called "pure" scientist.

The general scheme of the book is to give first an account of the anatomy of the organ, and then to follow this by the experimental data on its functions. The last chapter is a discussion of the interrelation of all these chemical senses. One of the most striking features of the sense of smell is its extreme delicacy. Mercaptan, a liquid with a penetrating garlic odour, can be recognized at a concentration of 1/460,000,000 of a milligramme in 50 cubic centimetres, the latter being the volume of air which must be drawn into the nostrils in order to smell. The sense of taste appears to be four separate senses, one for sweet things, another for bitter, another for sour, and still another for salt. The "common chemical sense" is the one which informs us of the presence of irritating substances and is to be found in practically every mucous surface of the body. This book will hold the interest of anyone who wishes to know more about the way in which his senses inform him of the world outside himself. J. M. D. O.

Les Problèmes Actuels de Diététique. By Paul Carnot, Marcel Labbé F. Rathery, O. Josué, Ph. Pagniez and Lereboullet of the Faculty of Medicine, Paris. 8vo, 184 pages. Paris, 1923: J. B. Bailliere et fils. Price, 8 francs.

This is one of a small series of handbooks on therapeutics issued under the general editorship of Professor Paul Carnot. It is a splendid presentation of our present day knowledge of the principles of diet in health and disease, written in a style which is easy to follow, condensed yet complete. Professor Carnot deals first with the subject of a balanced diet, with which is included the subjects of hyperalimentation and restricted diet as applied to various diseases including obesity. Professor Rathery discusses acidosis and metabolic disturbances, and in another essay the deficiency diseases. The diet of the

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MONTREAL

growing child, his food requirements and the various artificial feedings are considered by Professor Lereboullet. The diet of old age is treated by Dr. Josué, and there is an excellent chapter on food anaphylaxis by Dr. Pagniez. The final chapter, by Professor Labbé, is on the diet-kitchen and how it may be practically conducted in connection with hotels, hospitals and health resort stations. J. H. E.

The Biology of Death By Raymond Pearl. Philadelphia: J. B. Lippincott Company, 1922, pp. 275. Price, $2.50.

This exceedingly novel and stimulating little book is one of the series of monographs on Experimental Biology, being prepared and published under the editorial guidance of Jacques Loeb, T. H. Morgan and W. J. V. Osterhaut. The present monograph embodies the material contained in the Lowell Institute lectures delivered by the author in 1920. In a prefatory statement the writer's purpose is given in the following words: "I have tried to bring together under a unified viewpoint some of the more important contributions which have been made to our knowledge of natural death from three widely scattered sources, namely, general biology, experimental biology and statistical and actuarial science." In eight chapters crowded with interesting material, the problem itself, the conditions of cellular immortality, the chances of death, the causes of death, embryology and human mortality, the inheritance of the duration of life in man, experimental studies on the duration of life, natural death, public health and the population problem, are dealt with. A satisfactory bibliography and sixty-four useful illustrations are among other valuable things in this book.

So much of the content of the "Biology of Death" is desirable in the development of a sound general biological viewpoint on the part of physicians that every medical practitioner, as well as others interested in preventive medicine, should regard this as an essential book to have read and digested.

Because one cannot agree with all the author's conclusions is an added reason for reading this book. To refute any of Pearl's general conclusions requires the exercise of just that sane critical faculty which, in all of us, frequently requires stimulation. This monograph is very much worth while. J. G. F.

Meckel's Diverticulum and Intestinal Obstruction.—Harold L. Foss, Danville, Pa. (*Journal A.M.A.*, July 14, 1923), records the history of a patient operated on for the relief of acute intestinal obstruction following the strangulation of a loop of ileum by an adherent Meckel's diverticulum. The clinical picture of the condition is not unlike that of intestinal obstruction from volvulus from any cause. The only sign that ever presents itself and which may be considered significant is the appearance of a mass at or near the umbilicus.—*Journal A.MA.*, July 14, 1923.

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INJURIES TO THE FOREARM AND HAND*

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When I was asked by the secretary to open the discussion on injuries to the forearm and hand, I took it for granted that this particular subject had been selected because of its importance from an industrial point of view and because of its interest to a very large group of medical men, including not only surgical specialists but also, and perhaps most important, the general practitioner. With this in view I have tried to confine my remarks to the more common injuries and lay no claim to any particularly original views. I have merely tried to gather from various sources, including my own personal experiences, some practical hints on the treatment of this very important class of injuries.

In order to amplify my statement in regard to the importance of forearm and hand injuries from an industrial standpoint, I asked for and was granted permission to make a summary of the cases that have come under the Workmen's Compensation Board of Manitoba. A brief review was made of the accidents which occurred during the past two years, numbering in all 16,428. Of these, 2,354 or 14.3 per cent were injuries to the forearm and hand, and the average duration of the disability, reckoned from the standpoint of compensation paid, was twenty days. Some permanent disability followed in 7.73 per cent. Laceration and crushing injury of fingers formed the largest group, 801 cases, with average length of disability of thirteen days. The fracture cases numbered 185 with average disability of forty-six days, phalangeal fractures requiring twenty-six days, and fractures of radius and ulna together, seventy-three days. Strange to say, only one case of carpal fracture is noted in this series. This may possibly be explained by what will be said later in dealing with fracture of scaphoid. Some of the carpal fractures may be included in the group of eighty-two sprains of wrist. The thirty-nine cases of finger tendons severed had an average disability of fifty-five days, and twenty-three cases or sixty per cent. were discharged with some permanent disability. The importance of this class of injury will be referred to later.

The statement has been made recently[1] that the greater disability caused by comparatively minor lesions of the upper limb, as compared with similar lesions of the lower limb, is explicable by the finer adjustment of the neuro-muscular mechanism and more sensitive connection between the brain and periphery found in the former. Whether this be true or not, it serves to emphasize the fact of the relative importance of so-called minor injuries of the upper limb.

Although the question of infection does not come within the scope of this discussion, yet it must be borne in mind that the presence of septic foci in other parts of the body may interfere to a very marked degree with the successful treatment of injuries, and should be cleared up at the earliest moment.

I do not propose to classify injuries into major and minor groups, for the simple reason that some of the so-called minor injuries require much more careful and skilful treatment than many of those which are designated by the more pretentious term.

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*Read at the Canadian Medical Association Meeting, Montreal, June 12th, 1923.

Fractures

In considering the treatment of fractures, there are several points which one should always have in mind. In the first place a reasonably accurate knowledge of the anatomy of the part is essential, particularly the muscular attachments which may have a part in producing deformity, or reproducing deformity after reduction. In the second place, it must be borne in mind that in the care of a fracture the treatment is not limited to the site of fracture, but to a greater or less extent involves the whole limb, and the length of time of immobilization, when and how to begin movements, and when to discard fixation apparatus are all of prime consideration.

It will, I think, be taken for granted that a good functional result is of more importance than a good anatomical result, but in the vast majority of cases the former is only obtained in conjunction with the latter. The brilliant exceptions in no way nullify the general principle. It may, however, be modified to a certain extent by stating that good functional results in children depend less upon good anatomical results than in older patients, or in other words the older the patient, the more important it is to secure anatomical reposition of the fragments.

Another consideration which it seems hardly necessary to mention, is that fractures in the vicinity of, or involving a joint, may result in ankylosis of that joint. Hence it should be an invariable rule to immobilize the joint in that position in which, if ankylosis should occur, the limb will be the most useful.

It has been stated[2] that fractures of both bones of the forearm are the most poorly treated of all fractures in the body. This is probably due to the difficulty in getting accurate apposition of the fragments and in retaining them in good position. This is of greater importance than in fracture of other bones. The fractured ends must be brought into good apposition. Even when a good position of the fragments is obtained, the end results may be disappointing because of excessive callus formation or non-union.

When the fracture of the radius is situated below the level of the insertion of the pronator radii teres it is customary to place the forearm in the mid-prone position, i.e., with the palm facing towards the chest. Not only is this attitude the most favourable for insuring correct apposition of the fragments, but it has the advantage also of being the position of greatest ease for the limb. When the radius fracture, however, is above the insertion of the pronator radii teres, it is all important to prevent union taking place with rotary displacement, and with this object in view it is necessary to maintain the forearm flexed and fully supinated during the healing process, so that the lower fragment may be brought into proper line with the upper.

In fracture of both bones, accompanied by marked displacement which cannot be satisfactorily rectified by manipulation, conservative treatment is as a rule unsatisfactory. In such cases it would certainly be better to expose the fractured ends and apply some form of mechanical fixation than incur the risk of faulty union and greatly impaired function. There does not seem to be any valid reason for delaying operation, presumably to get the tissues in better condition. The earlier the open operation is done, the easier it is and the more satisfactory the result. Hence, it should be carried out as soon as it can be determined that non-operative measures are not likely to succeed.

Fracture of the shaft of the ulna is not infrequently accompanied by dislocation of the head of the radius, which may be overlooked unless one is on the look-out for it. In this case the arm of course should be put up in acute flexion after reduction.

It may seem almost unnecessary to refer more than by way of mentioning it, to Colles' fracture, but Colles' statement that this is by far the most common injury to which the wrist or carpal extremities of the radius and ulna are exposed is probably still true to-day, and judging from the prominence it occupies in present day surgical literature, one cannot fail to draw the conclusion that the results of treatment are not by any means uniformly satisfactory. It is certainly true that the usual text-book method of reduction, which is practically that described by Colles in his original article published in 1814, viz., by taking a grip of the hand as if shaking hands, is in many cases quite insufficient. The method described by Sir Robert Jones is probably the simplest, easiest and most effectual. He grasps the patient's arm in his left hand, if the left is the injured arm, with his own scaphoid tubercle against the projecting lower end of the shaft. His right hand he places on the dorsum of the patient's wrist with his own scaphoid on the projecting lower fragment. A firm grip with a slight traction and twist of the wrist, completely reduces the deformity. As he says, it requires knack rather than strength.

I have never forgotten the method described by the late Dr. Murphy. Grasp the forearm and wrist firmly with both hands, placing the thumbs on radial border, at site of fracture. Increase the deformity to disengage the fractured ends, and then by traction and flexion of the wrist the lower fragment is manipulated into position.

If reduction is complete it is not of extreme importance what particular form of splint is used. Plaster of Paris is convenient and comfortable, but it has its disadvantages and in the writer's opinion is not the best form of splint for this particular fracture. Sir Robert Jones recommends thin, sheet metal splints, a posterior one extending from the external condyle of the humerus to the middle of the meta-carpals and an anterior one stopping short of the thenar eminence. The posterior splint runs slightly spirally from the ulnar side of the elbow to the radial side below and the anterior one has the twist in the opposite direction. The splints should be kept on for three weeks, allowing the patient light use of the fingers in the meantime. After three weeks the posterior splint should be removed and the patient gradually accustoms the wrist to ordinary work. The majority of surgeons advise the use of a general anaesthetic and in this the writer hearily concurs. In cases of long standing ,where the usual methods of reduction are not sufficient, much may be accomplished by the use of the Thomas wrench.

The most common injury to the wrist bones is fracture of the scaphoid, which according to one writer[3] occurs almost as frequently as Colles' fracture. Even without the aid of X-rays this injury in the acute stage should be readily diagnosed, but the frequency with which the condition is missed, renders it extremely important that all wrist injuries should be submitted to X-rays. When not diagnosed and consequently not treated, there is almost invariably a considerable amount of disability resulting and this will probably be permanent.

There is always a definite history of an injury, usually with the wrist in a hyper-extended position, followed promptly by swelling and tenderness, most marked in the "anatomical snuff-box." It is not infrequently carelessly diagnosed as sprained wrist, a condition which occurs very rarely. In the acute stage, the typical swelling, the severe pain that is made worse by every sort of movement, the acute tenderness just over the scaphoid distal to the radial styloid process, and the limitation of movement, especially of dorsiflexion of the wrist, make up a picture that is so absolutely characteristic, that it is always possible to diagnose fracture of the scaphoid with perfect confidence.

Todd, of London[4], in a recent article reviewing the cases of fracture of the scaphoid treated at Guy's Hospital, states that the great majority of cases that present themselves are examples of old fracture, and that the reason for attending is invariably the same, viz., that the wrist is not as good as it was or as it should be, and that it interferes materially with wage-earning capacity, either because it hurts or is weak, or for both reasons.

The usual cause of disability seems to be non-union and the secondary results, such as chronic arthritis, to which it gives rise. Codman and Chase[5] say, "If the fracture remains ununited, the permanent amount of disability is so great that it seriously interferes, not only with the comfort of the patient, but with his ability to enjoy certain games and sports, and also in the case of working men, it limits their working capacity and hence their ability to earn their living." The non-union may be partly due to the low power of repair in the carpal bones, and partly to the fact that the fracture surfaces are bathed in synovial fluid, but the chief factor seems to be mobility. The majority of cases that remain ununited give the history that the wrist was not put at rest for any length of time.

It is important, therefore, that the condition be recognized early and treated early. If there be displacement, and the displaced fragment cannot be manipulated into position and retained there, one or both fragments should be removed. Where there is no displacement, the treatment should consist in immobilization in a long cock-up splint for three weeks, followed by the usual physio-therapeutic measures. The average time which must elapse before full work can be resumed, is not far short of three months. If by this time function has not been restored, and the patient still complains of pain on movement, it is probably wise to operate and remove one or both fragments. Late operation is usually disappointing, and if put off until the joint is the seat of chronic arthritis, is doomed to failure.

Another injury to the wrist, which may occur alone or in conjunction with a fracture of the scaphoid, is dislocation of the semi-lunar bone. It is produced usually by a fall on the palm of the hand with the wrist hyper-extended, in much the same way as a Colles' fracture is produced. The diagnosis is not difficult as a rule. There is marked disability and pain. The fingers are flexed and held rigid, owing to the pressure on the flexor tendons, and there is frequently numbness or tingling, owing to pressure on the median nerve. The diagnosis should, of course, be confirmed by X-rays. If seen early an attempt may be made to reduce the dislocation by manipulation under general anaesthesia. This failing, open reduction must be tried and as a last resort excision of the bone may have to be resorted to. If the dislocation be associated with fracture of the scaphoid, excision of the semi-lunar together with the proximal fragment or all of the scaphoid, will probably give the best functional result.

Fractures of the meta-carpal bones do not, as a rule, present any special difficulties. The fragments can usually be manipulated into position and maintained therein by a suitable palmar splint, or by strapping the hand and fingers over a thick roller bandage.

Fracture of the base of the first meta-carpal or as it is commonly called, Bennett's fracture, is best treated by means of a gutter-splint, with the thumb held, as so aptly described by Sir Robert Jones, in the position occupied when holding a glass of water.

Fracture of any of the meta-carpals or phalanges occasionally requires some extension. This can be obtained quite easily by means of adhesive tape or glue, and a suitable wire frame.

The question of fractures can hardly be disposed of without taking into consideration that of ischemic paralysis. This very disabling complication may be associated with fractures of the lower part of the fore-arm, though it is more commonly a sequel of fracture higher up. Unfortunately in the majority of cases the blame for its occurrence must be placed on the surgeon in attendance, and is due to too tight bandaging. It must not be forgotten, however, that it may be caused by pressure from within as it has been observed in cases in which no constricting dressing was applied. The pathology of the condition consists of a myositis, resulting in a fibrosis and consequent contracture. The damage is done within twenty-four to forty-eight hours, and the danger signal is pain. Here as elsewhere prevention is much better than cure, and preventative treatment consists in the careful application of well-padded splints, followed by careful supervision of the injured limb for the ensuing twenty-four hours. No patient with splints just applied should be discharged without definite instructions to return immediately or to remove the splints if the limb becomes painful.

The treatment of the established condition consists in gradually stretching the muscles, joint by joint, beginning at the fingers. Here again one cannot do better than quote Sir Robert Jones[9]. First: An assistant passively flexes the wrist to allow the fingers to extend and each finger is separately strapped to a little gutter-shaped splint, so that they cannot curl up. Second: A day or two later, or in milder cases at the same sitting, the metacarpo-phalangeal range is stretched and the palm and splinted fingers are bandaged to a flat metal splint. The whole hand and fingers are now rigidly extended with the wrist flexed. Third: The wrist is now from day to day extended a little and fixed. This is continued until the wrist is hyper-extended. This hyper-extension of wrist and fingers is maintained for some time in obedience to the principles laid down concerning the extension of scars, massage being systematically practised.

Injuries to Tendons

It is a matter of surprise how lightly the majority of text-books pass over the question of repair of tendons. One might easily arrive at the conclusion that no great difficulties are involved. On the other hand, Bunnell, of San Francisco, writes[6]: "One of the most baffling problems in surgery is to restore normal function to a finger in which the tendons have been injured. Anyone who can devise a method by which success can be almost guaranteed will be conferring a great blessing on the many sufferers from this type of injury, and in addition make a considerable financial saving for insurance companies." He is perhaps over pessimistic, but the fact remains that the repair of injured tendons of the hand is an operation which is often extremely disappointing in its results. This is particularly true of the flexor tendons. Good functional repair is much more easily obtained in the case of the extensors.

One can hardly dissect a hand without being impressed by its wonderful workmanship, and Bunnell says, "Though its tissues are tough and compact, its tendons, tendon sheaths, pulleys, joint surfaces, and flexible joint capsules all glide on each other so easily and smoothly that there is little in the refinement of motion that the hand cannot do. If infection or trauma insults these perfected parts, a tissue reaction will occur, which will bind the gliding surfaces together, thicken and stiffen the joint capsules, congeal the tissues of the finger, strangulate the nerves and vessels and loss of function will result."

In no class of surgery is it more important that operation should be done with the strictest asepsis and utmost gentleness in the handling of tissues. Unfortunately, in the majority of cases, injury to the tendon is accompanied by an injury to the skin and other soft tissues, which is potentially septic. In all such injuries, therefore, an immediate cleansing of the wound and adjacent parts should be scrupulously carried out. Immediate suture of severed tendons, and if possible, repair of the tendon sheath as well, holds out the best prospect for complete restoration of function. If immediate repair cannot be done it is best to wait for complete subsidence of all infection before making the attempt. In either the early or late operation, if an incision must be made, its position is important. The median incision in the finger should never be used. A lateral incision will give the necessary exposure, do less damage to the tendon sheath, and is less liable to cause contractures.

Misunderstanding as to the action of the interossei and lumbrical muscles sometimes leads to errors in diagnosis. It should be borne in mind that these muscles act by flexing the metacarpophalangeal joints, and extending the interphalangeal ones.

In uniting cut tendons, failure is, as a rule, due either to the suture giving way or the tendon becoming fixed by adhesions. To prevent the former, various methods of inserting the sutures have been tried. It certainly is of little use to pass them through the whole thickness of the tendon and simply tie them together. They only cut their way out between the parallel bundles of fibrous tissue and fray out the end of the tendon. Of the numerous methods of suture, I will only mention a few. Burghard[7], in the *Oxford Surgery*, recommends what he calls the lateral suture. "A fully curved intestinal needle threaded with medium-sized catgut is made to pick up a small thickness of the tendon by introducing it transversely to the long axis about a quarter of an inch above the cut end. The tendinous bundles thus picked up are secured by knotting the suture firmly, and a similar suture is introduced and tied at a corresponding point in the tendon on the opposite side of the gap. It will be found that the two ligatures can be tied firmly together, and there will be no risk of their being pulled off the tendon to which they are attached. Two, three, or four of these double sutures are applied according to the size of the tendon, and they are reinforced by sutures of the finest catgut, which adapt the edges accurately after the lateral sutures have taken the tension."

Kanavels' suture has many points in its favour. "The sutures are so introduced and tied that none of the suture material appears on the surface and the knot is between the ends of the tendon. Fairly heavy silk, which has been smeared with vaseline so as to make the suture slip more easily, is threaded on a straight needle. The needle is now passed into the end of the tendon somewhat to one side of the centre and passes out of the side of the tendon about one-third of an inch from the cut end. It is then reinserted at the same point at which it made its exit, passed transversely across the long axis of the tendon making its exit upon the side about one-third of the way around; is again reinserted at the point of exit coming out on the side at the other third of the circumference. The needle is again reinserted at the same site, but now passes down and out the cut end of the tendon, not in the centre, however, but so as to cross the silk as originally inserted. The procedure is repeated with the other cut end. Fine coaptation sutures are applied."

Another useful suture is that described by Fuld, of New York. "The needle enters the tendon on its lateral surface half an inch above the cut end, passes transversely through the thickness of the tendon to emerge on the opposite side. The needle then enters the tendon on its anterior surface, at a point quarter of an inch from its cut end and three-fourths of the distance across the tendon. Perforating to half its anteroposterior thickness, it passes longitudinally through the length of the tendon emerging at its cut end to one side of the median line. The free end of the silk is crossed diagonally over the other suture, perforates the tendon quarter of an inch from the cut and passes through the length of the tendon and emerges on the other side of the median line. Sutures are now passed in similar fashion into the other end of the cut tendon, and then tied to corresponding suture ends opposite, burying the suture knots between the approximated tendon ends."

The best suture material is probably silk, as catgut, especially if fine, is uncertain in durability and may give way before firm union has been established. It is important to have as little tension as possible on the sutures. Much can be accomplished in this way by judicious splinting. For example, if the injured tendon be a flexor of the middle finger, this finger should be put up in the flexed position, the remaining fingers in the extended position and the wrist slightly flexed.

To prevent adhesions it is important that the operation be done with as little damage as possible to the tissues, especially the tendon sheath. If passive motion could be begun immediately after operation and maintained, one would probably not be bothered with adhesions. But this is plainly impossible. It has been demonstrated that it requires six weeks for a cut tendon to become firmly united. Hence it would hardly be advisable to attempt passive motion within three weeks and voluntary motion within six weeks. By this time the tendon is usually firmly united and firmly fixed by adhesions. To get over this difficulty, Fuld advises a two stage operation. After the tendon is firmly united, he advises a second operation to free it from adhesions followed by early passive motion. In cases in which the tendon ends have become widely separated and cannot be brought together it may be necessary to resort to graft. These may be obtained from the palmaris longis, flexor sublimis, extensor communis, or other tendons, and should be dissected out with their sheaths.

Crushing Injuries

Injuries commonly called crushing injuries form a very large and important group. In the treatment of these cases, the essential considerations are the prevention of sepsis and the saving of tissue. One cannot hope to get aseptic wounds in every case, but much may be done by prompt application of antiseptics. Tincture of iodine is probably the most convenient and effective, and should be applied freely, first to the areas of skin about the wound, and then directly to the wound.

When the question of amputation presents itself, the watchword should be conservatism. Four years ago in company with Dr. Gallie, of Toronto, I had the privilege of seeing some of Dr. Putti's cinematic work in Bologna, and we were both greatly impressed by his wonderful ingenuity. His results in devising means of producing various movements in artificial hands were beyond praise, and one can only marvel that his methods have not been more widely adopted. But wonderful as these results were, the fact still remains that the hand with which nature endowed us, must be badly mutilated indeed, before it can be equalled by the best artificial mechanism yet devised. Hence it behooves us to amputate only when no form of treatment holds out any hope of preserving the injured part, and then to amputate as little as possible. Even a part of a thumb is of much greater value than any form of mechanical appliance. The smallest portion of a finger that can be saved is of value to the patient, and no tissue should be sacrificed to permit of the performance of any set amputation. In all amputation of fingers above the centre of the middle phalanx, the cut flexor tendons should be united either to the extensor tendon or to the soft parts in the region of the cut end of the bone.

There should, however, be a very clear line of difference shown between conservative treatment where there is a chance to save a member which will be useful to the patient and the saving of a member, which, when saved will be absolutely useless or even an obstacle in the performance of his duties.

Judicious application of pedunculated skin grafts will often do away with the necessity of amputating portions of fingers or thumbs. These grafts can be very conveniently taken from the abdominal wall. They should be applied only after removal of all scar tissue, and in shaping them, the length of the graft should never be more than three times the width. They should be a third larger than the area to be covered.

Nerve Injuries

Time will not permit any lengthy discussion of nerve injuries, which not infrequently complicate wounds about the wrist. An injury to the ulnar nerve is rarely unaccompanied by injury to tendons, but the median nerve lying subcutaneously at the wrist is frequently injured alone. When the median nerve is injured at the wrist without division of tendons, deep touch can be appreciated over the whole of the affected area. For this reason the division of the nerve is frequently overlooked, more frequently in fact according to Sherrin than division of all other nerves put together.

Division of the ulnar nerve is also frequently overlooked on account of the slight sensory disturbance produced. It is only by carefully examining in a routine manner all injuries in the region of the wrist, that errors will be avoided. The treatment, of course, does not differ from that of nerve injuries elsewhere, and the prognosis is fairly good, particularly in the case of the median.

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SEVERE INDUSTRIAL INJURIES TO THE FINGERS AND THEIR TREATMENT

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INJURIES to the hand and fingers occupy a prominent place in the casualty list of any large industrial plant. This statement, no doubt, holds true in any centre of industry, but the safe-guarding devices, and the laws which compel machine protection, are slowly cutting down the number of accidents to the hand. It is difficult, however, to make mechanical appliances foolproof, so damage continues to be done in a direct ratio to the caution exerted by operators. In the textile industry this type of injury is seen more often than is any other.

In a cotton mill carrying a payroll of 2,300 employees; with 5,000 looms of English, Canadian, and American make, with 200,000 spindles; with all its own bleaching, dyeing and finishing departments; with machine shops; with a woodworking mill; with power-houses generating 16,000 horse-power; and with a large dairy farm thrown in for good measure, the writer is continually amazed at the very small percentage of serious finger and hand accidents. Slivers in the hand, avulsion of nails, emery-wheel and other abrasions, contusions, lacerations caused by rapidly moving knives and saws, burns that range from the electric type to those of scalds and chemical irritation, fractures—all these are treated with a desire, in the serious cases particularly, to prevent disability or at least to minimize it.

In a well equipped dispensary, which is an integral part of the plant, the patients are seen immediately after the accident. Here, nearly 7,500 cases, medical and surgical, are handled yearly. According to statistics, about sixteen per cent. of the total surgical cases are finger and hand injuries, or a little over 1,200

Keeping in mind that the hands are of first importance in the equipment of the average worker, and that the wage-earning capacity of these hands must be preserved as nearly intact as possible, the efforts of the industrial surgeon are directed toward minimizing any threatened disability. Among the injuries most likely to produce disability, (traumatic amputation being included) are severe crushing, causing damage to the bones and joints, and severe lacerations involving tendons, or burns leaving a scar tissue and deformity as *sequelae.* Any accident to the hand or fingers which throws into relief a prospect of decreased efficiency in the present occupation or promises to hinder in other types of work must be considered serious. The courts of any large industrial centre demonstrate some of the serious aspects of these injuries when these tribunals are clogged with claims for disability. The Workmen's Compensation Act has attempted to place a definite value upon the loss or impaired function of each finger, but even this forward step does not meet with unanimous approval among surgeons, as some authorities feel that sufficient emphasis has not been put upon this subject.

In the cases seen and treated by the writer, injury never extended farther than the proximal portion of the third phalanx of any finger. In the textile injury it seems a rule that the distal portions receive the brunt of damage. Possibly this is explained by the rapid methods for stopping even ponderous machinery or by the quick withdrawal from the danger zone. Very often the accident produces such a mangled mass that surgical wisdom dictates amputation with the alluring vision of healing by primary intention and a short absence from work; but policy and hope withhold action. Here is the Scylla and Charybdis of the industrial surgeon's existence; if he can always manage to steer a course between the two and achieve the golden mean, he will gain the everlasting gratitude of the worker, and incidentally cut down accident insurance rates. Save first, correct afterwards. In all injuries that require long treatment, the consideration of a final good functional and cosmetic condition plays no small part. Frequently perfect function goes along with a deformity which may be the basis of a claim for compensation.

In each of the case reports presented below, there was laceration of tissue, bone damage, and subsequent infection. The preliminary treatment consisted of cleaning up the parts with gasoline and green soap as the majority of the wounds were covered with grease and dirt; iodine was then applied. Dr. Irving Clark, at the Norton Company, Worcester, Mass., states that in ordinary abrasions and lacerations, the technique of gasoline and iodine cut down the incidence of infection to one per cent. Every living bit of tissue was salvaged, and if fracture complicated the condition splints were used to immobilize. It was very difficult to forestall infection in these serious cases; it may be done, but the writer has not yet had the good fortune to avoid this *bete noire.* As soon as this condition supervened a bath was used with a hot solution—boric acid was found to be as good as any. In a few of the cases Wright's and Dakin's solution were tried, but no better results were observed than with boric solution.

The patient was brought to the dispensary every morning and his hand was kept in the bath for two or three hours. After this the wound was covered with a dry gauze dressing which contained one to three drams of boric acid powder and the invalid was sent home with instructions to immerse his hand, without disturbing the bandage, in a basin of water as hot as he could endure comfortably. He was to do this for half an hour every two hours. In following this routine there is the possible inconvenience of the tissues becoming waterlogged, especially in cases where the injury has been extensive. This was overcome by stopping the solution treatment, swabbing with iodine and allowing an interval of a day or two. Very often the patient became discouraged at the slow progress made and needed strong assurance that the finger would eventually be better than a stump. It is a distinct pleasure after days and days of treatment to see the gradual improvement and the final healing. Stiffness, sensitiveness, limitation of joint movement follow in varying degrees, but these disappear with massage and movement both passive and active. At this period the patient is sent to his work and is kept under medical supervision until he is following his occupation without any discomfort. In only two of the cases seen was the damage so severe as to indicate amputation—all the others obtained results which enabled them to resume their work with an inconsiderable disability.

The frequency with which these serious finger injuries occur and the almost miraculous response they make to conservative treatment convinces the writer that the policy of saving first and correcting afterwards should be followed more widely, above all in industrial surgery.

SUMMARY OF CASE REPORTS

Leo. L., age 17, injured November 22nd, 1922. —Caught right index finger in a rapidly moving shearing machine. Distal portion mangled beyond hope of saving. Distal joint opened and destroyed. Amputated just above the head of the second phalanx, saving as much of the palmar tissue as possible to make a good flap. Became slightly infected....moist dressings and bath of hot boracic acid solution. Resumed work thirty-nine days later with a splendid stump.

Chas. C., age 41, injured January 29th, 1923.—Distal phalanx left thumb lacerated on a circular saw, fracturing the distal phalanx; nail was torn; infection followed with portion of phalanx sloughing out. Followed hot solution treatment with perfect result. Discharged seventy-two days after accident.

Irene F., age 16; injured February 10th, 1923.—Right hand caught in a comber. Very severe laceration of middle finger extending to the head of the proximal phalanx with fracture of the distal and second phalanges; laceration and fracture of the distal phalanx of the little finger; in both fingers the nail was torn out; portions of tissue and fragments of bone removed. Fingers dressed and placed on splints. Here, obviously, the indication was to amputate; but it was decided to attempt to save the fingers, particularly the middle one. After eighty-six days the girl was sent to her work with her fingers only slightly sensitive and with a very slight limitation of movement in the second joint of the middle finger.

Henri B., age 37; injured March 13th, 1923.—Distal portion of left little finger caught in the crank shaft of a loom and all but amputated. Distal phalanx was fractured. The lacerated fragment was strapped into position and union occurred within two days. Infection set in and hot solutions were resorted to. A perfect plastic and functional result was obtained in forty-one days.

Joseph D., age 15; injured April 17th, 1923.—Right middle finger caught in gears....Distal phalanx crushed and lacerated; the tissue over the palmar surface of the second phalanx deeply lacerated. A long palmar flap was used and sutured to the dorsum of the finger after the phalanx had been removed. Returned to work with a good stump after forty-one days.

RETRO-PHARYNGEAL ABSCESS; AND EROSION OF INTERNAL CARODID ARTERY; WITH PATHOLOGICAL SPECIMEN*

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THE unique pathological specimen which accompanies this paper, I owe to the kindness of the Surgical Staff of the Hospital for Sick Children, to whose service the case was admitted in August, 1922. The possibility of the occurrence of the fatal complication of which this case is an illustration is mentioned in several of the references given below, and four similar cases were reported by Carmichael[1] in 1881, Lidell[2] in 1883, Travers[3] in 1902, and Wylie and Wingrave[4] in 1906, but no evidence has been found to show that a specimen illustrating the condition exists in any other collection.

Advantage has been taken of the opportunity presented by this specimen to investigate the records of cases of retro-pharyngeal abscess at the Hospital for Sick Children in order to glean from them a composite clinical picture of the symptoms, signs, course, and fate of actual cases. The tabulation of these cases has been made in the last eight years only and the records have been found deficient in many respects. For example, one record gave but a few lines of history and a good description of the position of the abscess, while another had an excellently written story of the illness and no description of the throat. This report therefore is not to be considered final. An effort is now being made to greatly raise the standard of our case histories so that future reports may be sufficiently accurate for statistical purposes.

Definition.—A retro-pharyngeal abscess is a collection of pus in the connective tissue beneath the mucous membrane of the posterior wall of the pharynx.

Anatomy.—The anatomy of the posterior wall of the pharynx will be readily understood by careful consideration of the following three cross-sections taken from Eycleshymer and Shoemaker[5]. The first cross-section (Figure I) is cut through at the level of the hard palate. Directly behind the mucosa of the pharynx is a thin strip of muscle continuous at the sides with the palate—the M. pharyngo-palatinus (Palato-pharyngeus). Behind this muscle a thin layer of connective tissue, which becomes broader at the sides represents the retro-pharyngeal space at this level. It is bounded posteriorly by two muscles—the M. longus capitis (rectus capitis anticus major) and the M. rectus capitis anterior (rectus capitis anticus minor). At the sides the retro-pharyngeal space is continuous with the pharyngo-maxillary fossa—a fossa having firm muscle boundaries, but a fossa in name only, for it is completely filled by connective tissue and important vessels and nerves.

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*From the Department of Oto-laryngology University of Toronto, Toronto.

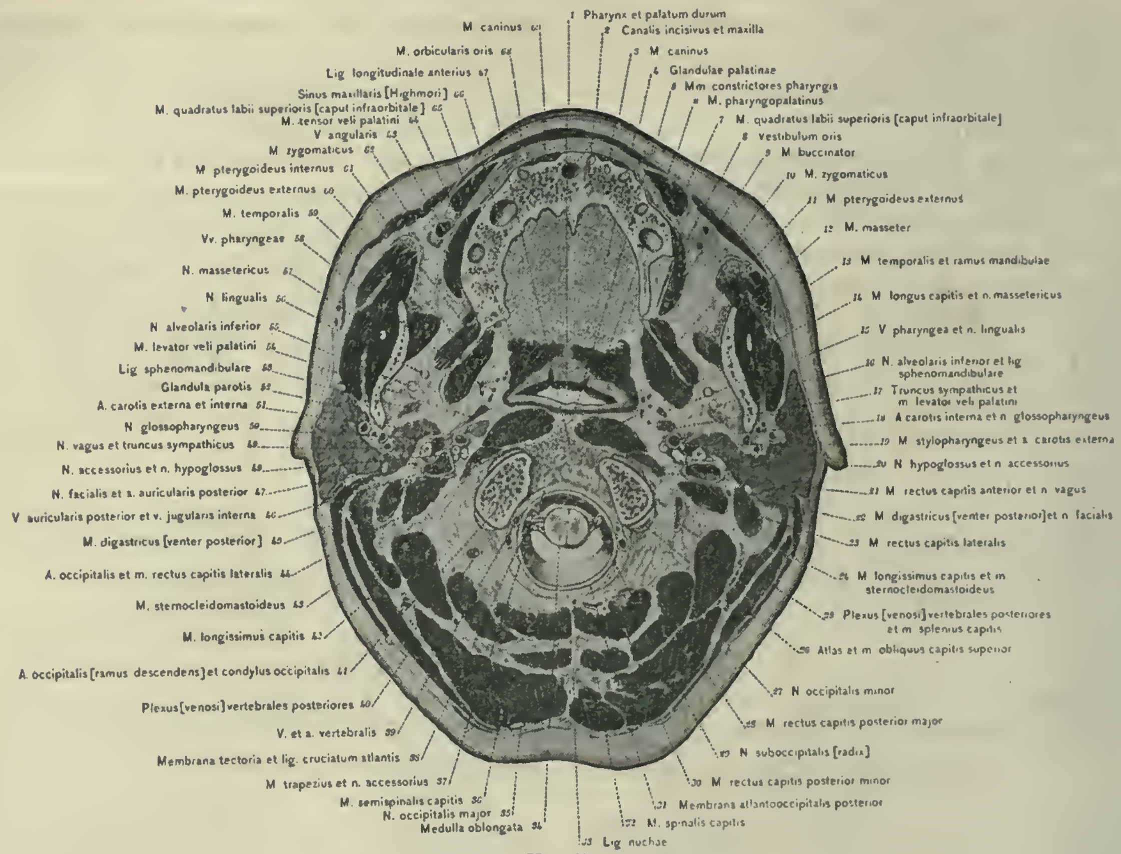
M caninus 69
M. orbicularis oris 68
Lig longitudinale anterius 67
Sinus maxillaris [Highmori] 66
M. quadratus labii superioris [caput infraorbitale] 65
M. tensor veli palatini 64
V angularis 63
M zygomaticus 62
M pterygoideus internus 61
M. pterygoideus externus 60
M. temporalis 59
Vv. pharyngeae 58
N. massetericus 57
N lingualis 56
N alveolaris inferior 55
M. levator veli palatini 54
Lig sphenomandibulare 53
Glandula parotis 52
A. carotis externa et interna 51
N glossopharyngeus 50
N. vagus et truncus sympathicus 49
N. accessorius et n. hypoglossus 48
N. facialis et a. auricularis posterior 47
V auricularis posterior et v. jugularis interna 46
M. digastricus [venter posterior] 45
A. occipitalis et m. rectus capitis lateralis 44
M. sternocleidomastoideus 43
M. longissimus capitis 42
A. occipitalis [ramus descendens] et condylus occipitalis 41
Plexus [venosi] vertebrales posteriores 40
V. et a. vertebralis 39
Membrana tectoria et lig. cruciatum atlantis 38
M trapezius et n. accessorius 37
M. semispinalis capitis 36
N. occipitalis major 35
Medulla oblongata 34
1 Pharynx et palatum durum
2 Canalis incisivus et maxilla
3 M caninus
4 Glandulae palatinae
5 Mm constrictores pharyngis
6 M. pharyngopalatinus
7 M. quadratus labii superioris [caput infraorbitale]
8 Vestibulum oris
9 M buccinator
10 M. zygomaticus
11 M pterygoideus externus
12 M. masseter
13 M temporalis et ramus mandibulae
14 M longus capitis et n. massetericus
15 V pharyngea et n. lingualis
16 N. alveolaris inferior et lig sphenomandibulare
17 Truncus sympathicus et m levator veli palatini
18 A carotis interna et n glossopharyngeus
19 M stylopharyngeus et a carotis externa
20 N hypoglossus et n accessorius
21 M rectus capitis anterior et n vagus
22 M digastricus [venter posterior] et n facialis
23 M rectus capitis lateralis
24 M longissimus capitis et m sternocleidomastoideus
25 Plexus [venosi] vertebrales posteriores et m splenius capitis
26 Atlas et m obliquus capitis superior
27 N occipitalis minor
28 M rectus capitis posterior major
29 N suboccipitalis [radix]
30 M rectus capitis posterior minor
31 Membrana atlantooccipitalis posterior
32 M. spinalis capitis
33 Lig nuchae

FIG. I.

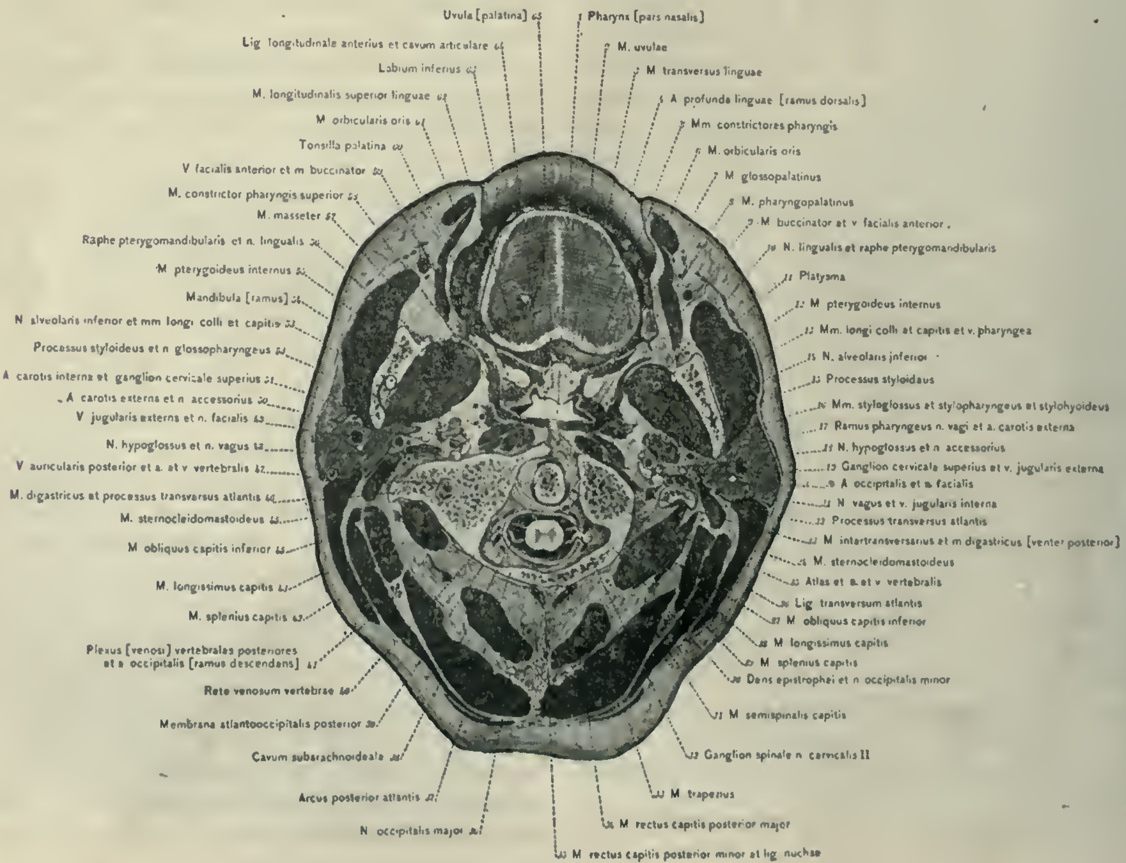
Uvula [palatina] 65
Lig longitudinale anterius et cavum articulare 64
Labium inferius 63
M. longitudinalis superior linguae 62
M orbicularis oris 61
Tonsilla palatina 60
V facialis anterior et m buccinator 59
M. constrictor pharyngis superior 58
M. masseter 57
Raphe pterygomandibularis et n. lingualis 56
M pterygoideus internus 55
Mandibula [ramus] 54
N alveolaris inferior et mm longi colli et capitis 53
Processus styloideus et n glossopharyngeus 52
A carotis interna et ganglion cervicale superius 51
A carotis externa et n accessorius 50
V jugularis externa et n. facialis 49
N. hypoglossus et n. vagus 48
V auricularis posterior et a. et v vertebralis 47
M. digastricus et processus transversus atlantis 46
M. sternocleidomastoideus 45
M obliquus capitis inferior 44
M. longissimus capitis 43
M. splenius capitis 42
Plexus [venosi] vertebrales posteriores et a occipitalis [ramus descendens] 41
Rete venosum vertebrae 40
Membrana atlantooccipitalis posterior 39
Cavum subarachnoideale 38
Arcus posterior atlantis 37
N occipitalis major 36
1 Pharynx [pars nasalis]
2 M. uvulae
3 M transversus linguae
4 A profunda linguae [ramus dorsalis]
5 Mm constrictores pharyngis
6 M. orbicularis oris
7 M glossopalatinus
8 M. pharyngopalatinus
9 M buccinator et v facialis anterior
10 N. lingualis et raphe pterygomandibularis
11 Platysma
12 M pterygoideus internus
13 Mm. longi colli et capitis et v. pharyngea
14 N. alveolaris inferior
15 Processus styloideus
16 Mm. styloglossus et stylopharyngeus et stylohyoideus
17 Ramus pharyngeus n. vagi et a. carotis externa
18 N. hypoglossus et n accessorius
19 Ganglion cervicale superius et v. jugularis externa
20 A occipitalis et a facialis
21 N vagus et v. jugularis interna
22 Processus transversus atlantis
23 M intertransversarius et m digastricus [venter posterior]
24 M. sternocleidomastoideus
25 Atlas et a. et v vertebralis
26 Lig transversum atlantis
27 M obliquus capitis inferior
28 M longissimus capitis
29 M splenius capitis
30 Dens epistrophei et n occipitalis minor
31 M semispinalis capitis
32 Ganglion spinale n cervicalis II
33 M trapezius
34 M rectus capitis posterior major
35 M rectus capitis posterior minor et lig nuchae

FIG. II.

Descending to the next section (Figure II)—at the level of the tongue—the retro-pharyngeal space is less evident, but the pharyngo-maxillary fossa is better defined than in the preceding section. The pharyngeal veins are now fewer in number but of larger calibre and lie in the outer edge of the superior constrictor of the pharynx. Just lateral to them is seen a bundle of muscles—the M. styloglossus, M. stylopharyngeus, and M. stylohoideus—which in their descent divide the pharyngo-maxillary space (Figure III) into an anterior chamber contiguous with the tonsil, and a posterior chamber containing in its hindermost part the internal carotid artery, the internal jugular vein, and their accompanying nerves. It is this posterior compartment which merits our attention in the consideration of the pathological specimen here presented. Figure III. shows well the broad band of connective tissue which is continuous laterally with the posterior compartment of the pharyngo-maxillary space and its main structure the internal carotid artery.

In the midline the retro-pharyngeal connective-tissue is condensed into a fairly resistent raphe, which binds the midline of the pharyngeal mucosa to the spine, so that a suppurative process which is opening up a space in the retro-pharyngeal connective-tissue on one side will not readily spread to the opposite side.

Theoretically the retro-pharyngeal space extends upwards to the septum nasi. Practically it extends but a short distance upwards owing to the fact that the subpharyngeal connective-tissue binds the mucosa very firmly to the anterior face of the basilar process of the occipital bone. Downward there is almost no limit to the theoretically possible extension. The retro-pharyngeal space may merge into the retro-oesophageal space.

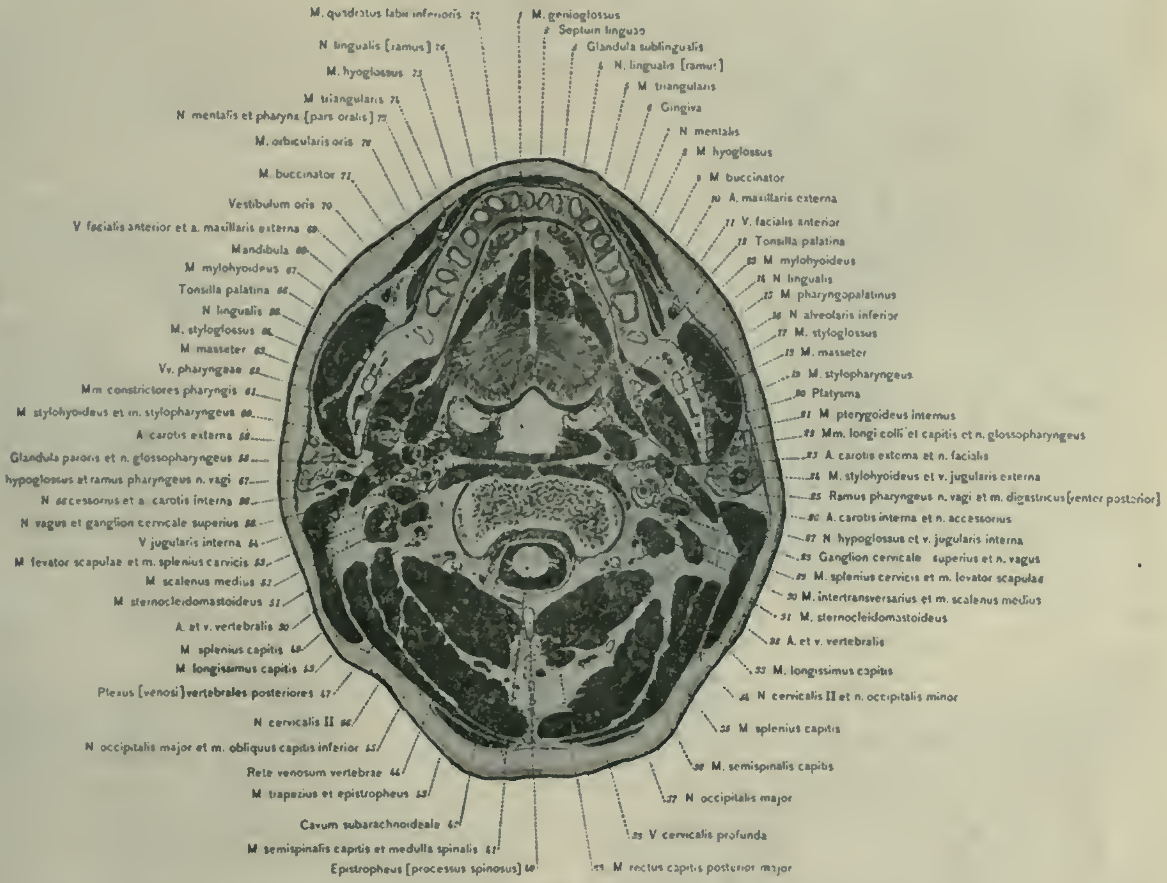
M. quadratus labii inferioris 77
N lingualis [ramus] 76
M. hyoglossus 75
M triangularis 74
N mentalis et pharynx [pars oralis] 73
M. orbicularis oris 72
M buccinator 71
Vestibulum oris 70
V facialis anterior et a. maxillaris externa 69
Mandibula 68
M mylohyoideus 67
Tonsilla palatina 66
N lingualis 65
M. styloglossus 64
M masseter 63
Vv. pharyngeae 62
Mm constrictores pharyngis 61
M stylohyoideus et m. stylopharyngeus 60
A carotis externa 59
Glandula parotis et n. glossopharyngeus 58
hypoglossus et ramus pharyngeus n. vagi 57
N accessorius et a. carotis interna 56
N vagus et ganglion cervicale superius 55
V jugularis interna 54
M levator scapulae et m. splenius cervicis 53
M scalenus medius 52
M sternocleidomastoideus 51
A. et v. vertebralis 50
M splenius capitis 49
M longissimus capitis 48
Plexus [venosi] vertebrales posteriores 47
N cervicalis II 46
N occipitalis major et m. obliquus capitis inferior 45
Rete venosum vertebrae 44
M trapezius et epistropheus 43
Cavum subarachnoideale 42
M semispinalis capitis et medulla spinalis 41
Epistropheus [processus spinosus] 40
1 M. genioglossus
2 Septum linguae
3 Glandula sublingualis
4 N. lingualis [ramus]
5 M triangularis
6 Gingiva
7 N mentalis
8 M hyoglossus
9 M buccinator
10 A. maxillaris externa
11 V. facialis anterior
12 Tonsilla palatina
13 M mylohyoideus
14 N lingualis
15 M pharyngopalatinus
16 N alveolaris inferior
17 M. styloglossus
18 M. masseter
19 M. stylopharyngeus
20 Platysma
21 M pterygoideus internus
22 Mm. longi colli et capitis et n. glossopharyngeus
23 A. carotis externa et n. facialis
24 M. stylohyoideus et v. jugularis externa
25 Ramus pharyngeus n. vagi et m. digastricus [venter posterior]
26 A. carotis interna et n. accessorius
27 N hypoglossus et v. jugularis interna
28 Ganglion cervicale superius et n. vagus
29 M. splenius cervicis et m. levator scapulae
30 M. intertransversarius et m. scalenus medius
31 M. sternocleidomastoideus
32 A. et v. vertebralis
33 M. longissimus capitis
34 N cervicalis II et n. occipitalis minor
35 M splenius capitis
36 M. semispinalis capitis
37 N occipitalis major
38 V cervicalis profunda
39 M rectus capitis posterior major

FIG. III.

Figure IV taken from St. Clair Thomson[6], illustrates the vertical extent of a retro-pharyngeal abscess and, therefore, of the retro-pharyngeal space. It will be seen that the cavity extends from the level of the basi-occipital above to that of the fifth cervical vertebra below; the swelling is greatest opposite the body of the second cervical vertebra. The way in which pressure can be exercised on the upper opening of the larynx is well illustrated.

So much, therefore, to demonstrate the existence and position of the retro-pharyngeal space and its lateral connection.

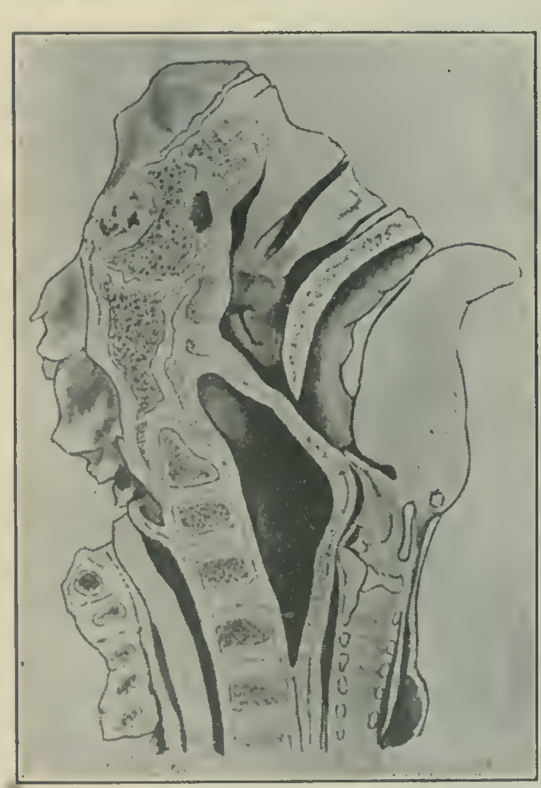

FIG. IV.—RETROPHARYNGEAL ABSCESS

Section through the cervical vertebræ, pharynx, and adjacent parts of a boy aged 2½, showing the cavity of a retropharyngeal abscess. The abscess extends from the level of the basi-occipital above, to that of the 5th cervical vertebra below; the swelling is greatest opposite the body of the 3rd cervical vertebra. The abscess cavity is lined by a brownish membrane; the posterior pharyngeal wall, which forms the anterior boundary of the cavity, appears thickened. The way in which pressure has been exercised on the upper opening of the larynx is well illustrated. There is no evidence of spinal caries, nor anything to explain the cause of the abscess. (*St. Bartholomew's Hosp. Mus., No.* 1841*a*.)

The first three figures are photographs of sections of the adult body and show no lymph-nodes in the retro-pharyngeal space. According to Most[7] and to Delamere, a few lymph-nodes are found in infancy beneath the mucous membrane of the pharynx, that is, in the retro-pharyngeal space; but these nodes are said to atrophy before the fifth year in the great majority of cases.

These retro-pharyngeal lymph-nodes are arranged in four groups, two on each side of the midline of the pharynx. They vary in size and number in each group but their general arrangement is vertical. The lateral group is found median to the internal carotid and is described as more constant than the medial group which lies in the retro-pharyngeal space closer to the midline. Both groups receive some afferent lymphatic vessels from the accessory nasal sinuses, the nasal fossae, the naso-pharynx, and pharynx, and send efferent vessels to the internal jugular group of the posterior deep cervical chain. Fairly constant in the first years of life these lymph-nodes rapidly undergo retrogression, so that whereas ten or more may be found in the infant there will rarely be found more than one in the entire retro-pharyngeal space of the adult.

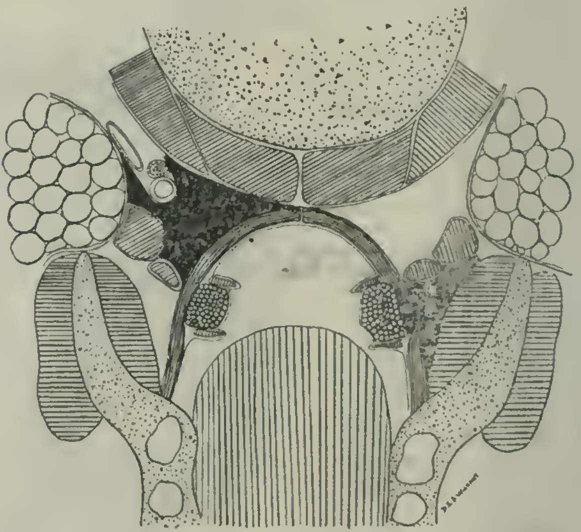

FIG. V.

Figure V is diagrammatic, but a close approximation to the exact anatomy as shown by cross sections, and is the result of my observations while studying this region under the instruction of Dr. H. P. Mosher, who has been prominent in emphasizing the importance of the pharyngo-maxillary fossa[10]. The advantages of this representation are as follows: it shows that the large vessels lie in the centre of the space: it emphasizes the fact that the lateral extension of an abscess would show as a bulge under the lower edge of the parotid in the upper part of the neck: and it demonstrates how a peritonsillar abscess will tend to locate in the pterygoid compartment of the pharyngo-maxillary fossa and have difficulty in extending either to the carotid sheath or to the retro-pharyngeal space proper.

Further the diagram indicates the structures penetrated by the incision into a retro-pharyngeal abscess, which are: 1, the pharyngeal mucosa; 2, the pharyngeal aponeurosis; 3, the superior constrictor muscle; 4, the bucco-pharyngeal fascia, (compare left side of Figure II); 5, the loose areolar tissue of the retro-pharyngeal space.

The median raphe of the pharynx has been emphasized. The superior constrictor muscle has been represented by lines parallel to the pharynx to indicate that the fibres of the muscle are more horizontal in their course than they are perpendicular which is the anatomical reason for our preference for using a vertical incision.

Etiology.—Theoretically suppuration may occur in the tissues between the mucous membrane of the posterior wall of the pharynx and the spine, as the result of: 1, injury to the posterior wall of the pharynx from blows or foreign bodies; 2, the burrowing of pus from other regions; 3, caries of the spine; and 4, suppuration in the retro-pharyngeal lymph-nodes.

During the last eight years there have occurred at the Hospital for Sick Children, forty-one cases of retro-pharyngeal abscess. Not one of these have been known to be the result of any of the first three theoretical causes just mentioned. This series may, therefore, be considered to be due in 100 per cent. of cases to suppurative lymphadenitis.

In twenty-four of the forty-one cases the onset was without assigned cause, but in seventeen, or forty per cent., there was an accompanying infectious process in the nose or ears.

Retro-pharyngeal Abscess
Etiology

Total cases of retro-pharyngeal abscess	41
Cases preceded by a definite illness	17
Cases of unknown origin	24
Cases accompanied by acute otitis media	7
Cases accompanied by naso-pharyngitis	9
Cases accompanied by cervical adenitis	25

Pathology.—The process is essentially first an adenitis, then a periadenitis, and finally a breaking down with suppuration and the formation of an abscess.

In twenty-six cases the abscess was described as definitely unilateral; in only a few cases was it noted that the abscess extended especially downward; in no case was it seen to extend much above the level of the soft palate; so that it may be concluded that the majority were confined to the oro-pharyngeal region.

The cervical lymph-nodes below and behind the angle of the lower jaw on the side of the abscess were enlarged or indurated in twenty-five cases, or sixty-one per cent. They were noted as inflamed in one case only. In one recent case the unilateral cervical swelling which was visible from a distance disappeared at once following the internal incision of the abscess, the reason for which can be easily understood by the study of plate No. V.

The age of the youngest child affected was four months; that of the oldest was thirty-six months; the average age was fifteen months.

Symptoms.—It is manifest that the condition is essentially one of infancy. The onset is, therefore, obscure, and dependence for history has to be placed upon parents who are frequently poor observers. Careful tabulation of our records shows that by far the most frequent causes for the anxiety of the parents were: 1, that the child was breathing or swallowing with difficulty and, 2, the appearance of swelling on one side of the neck.

Retro-pharyngeal Abscess
Complaint of Parent on admission of Child

Swelling in the neck	24
Breathing with difficulty	23
Difficulty in swallowing	16
Coughing	10
Feverish	10
Nose running	9
Ear running	7

The history has usually been meagre. The impression is gathered that the onset was acute in eleven cases or twenty-seven per cent., and insidious in twenty-eight cases or sixty-eight per cent.; and that, as a rule, the diagnosis has been made at the first examination of the child.

The clinical picture presented by the average case can be best understood by an examination of the signs presented by our series of cases.

Retro-pharyngeal Abscess
Examination of child at time of Admission

Acutely ill	24
Not acutely ill	13
Head markedly retracted	11
Highest temperature	104.6°
Lowest temperature	98°
Average temperature	100.4°
Cervical glands markedly enlarged	25
Marked dyspnoea	26
Retro-pharyngeal swelling noted as definitely unilateral	26

Diagnosis.—The examination of a sick child, especially one with marked swelling of the cervical glands and with history or signs of difficulty in breathing or swallowing would be criminally inadequate without examination of the throat. This should reveal to the physician the presence of any pharyngeal swelling and hence lead to the consideration of the probability of retro-pharyngeal abscess.

Yet the pharyngeal examination is the step most often accompanied by error. Our records show that one case was sent to the operating room for removal of tonsils and adenoids. The operator, the chief of the laryngological service, looked in the child's mouth, put away the tonsillectomy instruments, evacuated the abscess and has since refused to countenance operation on the throat without previous examination by one of his own department.

There are two factors which are responsible for the non-recognition of the condition. The first is its relative infrequency. The majority of any class graduating in medicine will not have seen a single case. During the last eight years there have been 33,892 new cases admitted to this hospital and yet a total of only forty-one cases of retro-pharyngeal abscess has been found. The second factor is the great difficulty of making a satisfactory examination of the inflamed throat of an infant or young child, especially if the child be seen at home in the arms of an apprehensive or perhaps indignant parent. The sympathetic physician working under disadvantageous conditions tends to relinquish his efforts before he has completed his examination and palpation. The detection of fluctuation in the swelling should at once lead to the diagnosis, but the anatomic relations of the parts may be thrown into chaos by the squirming of the child or the palpating finger may be untrained.

However, having determined the presence of a fluctuating swelling the physician must endeavour to rule out several possibilities before he diagnoses the condition under discussion here. Tuberculous disease of the vertical spine is rare but must be considered if there is history of rigidity of the neck of long standing, or if the child hold its head in its hands. In such a case it will be apparent that treatment can be delayed long enough to procure an X-ray photograph of the neck. Aneurysm of the carotid will be excluded by the absence of pulsation. In spinal osteomyelitis the symptoms will be very acute with high fever.

If, on the other hand, there be swelling but no fluctuation the possibility must be considered of lymphadenitis of the retro-pharyngeal nodes without the formation of pus, or of an acute pharyngitis in the throats of patients suffering from cervical scoliosis.

Progress.—In three cases the abscess had been opened prior to admission; in two cases the abscess was opened more than once; in nineteen cases the abscess was opened on the day of admission and in the cases so treated the fever, in all cases but six, lasted for not more than forty-eight hours following the evacuation of the abscess. Only one case died and it was the only case which presented any of the possible complications described in the references.

Treatment.—Many and various are the methods enumerated in the texts, for the procedure to be followed in the surgical treatment of this condition. The procedure to be described is that followed and taught by the laryngological service of the Hospital for Sick Children.

A case of retro-pharyngeal abscess is always to be considered an emergency, to be admitted at once for immediate evacuation of the abscess, and to be given constant supervision until out of danger. The operation is to be considered dangerous but at the same time safe if it is properly performed.

No anaesthetic is necessary. The child is swathed, placed on its back on a table, and a mouth gag inserted. The assistant stands behind the child's head, holds it between his two hands, and turns the head so that the abscess is on the lower side. Under inspection by reflected light the tongue is depressed by a suitable tongue depressor held by the surgeon in his left hand. The surgeon then takes in his right hand a pair of special pointed tonsil scissors, which he passes closed into the child's mouth until they touch the apex of the pharyngeal swelling. The scissors are plunged through the mucosa and the superior constrictor muscle covering the swelling, and opened wide so as to make a vertical slit and pulled out while still widely open.

All this is but the work of a few seconds. The important part of the operation is to follow. It consists in the attendant at once rolling the child on its side while the surgeon with the tongue depressor holds the tongue down and the cheek open so that the pus unable to find its way into the trachea and larynx flows freely out of the mouth. No local after-treatment is necessary.

The above procedure sounds and, in good hands, looks very simple; but the student, being taught an operation he may have to perform as an emergency, is cautioned that he must know what he is going to do, must be able to see where he is working, and must do what is to be done quickly. A child with this condition may easily and rapidly die if the operator bungle his job.

Of the forty-one cases at this hospital diagnosed as retro-pharyngeal abscess in the past eight years and given the treatment described, not one has been a fatality. One case which was not diagnosed, died and was found to have been suffering from retro-pharyngeal abscess—the case about to be reported.

E. B., 18 months old, was perfectly well until three weeks previous to being seen when a patchy sore throat developed. Two weeks later a swelling in the side of the neck appeared which was fomented and went down gradually. The child was playing about on the day before admission. On the morning of the day of admission it had a sudden haemorrhage from the mouth and lost about a bowlful of fairly dark clotted blood; and in the evening about seven o'clock had a similar haemorrhage of about a cupful of blood of a brighter red colour and more fluid. The signs of exsanguination were then very marked, the mucous membranes being almost white.

The child was brought to hospital for transfusion about eleven o'clock that night, was extremely anaemic and died within two minutes of reaching the admitting room. As the child had not been examined, a clinical diagnosis of haemorrhage, probably gastric, was made, but the autopsy revealed the true diagnosis of retro-pharyngeal abscess with erosion of the internal carotid artery, (Figure VI).

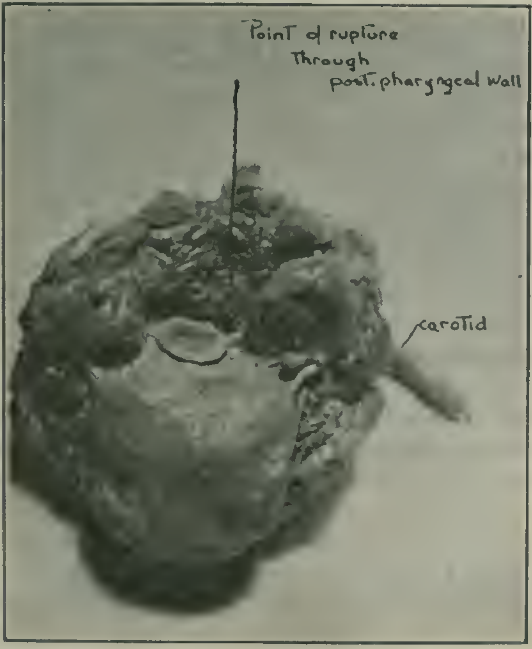

FIG. VI.

On dissecting the retro-pharyngeal tissue just to the left of the middle line of the pharynx there was found an abscess cavity which would hold about a drachm of fluid and which contained dark red clots. It had spread into the pharynx just to the left of the mid-line by an opening one-half centimetre in diameter. The wall of the internal carotid artery (Figure VII) was eroded for a distance of about two centimetres and lay on the posterior wall of the cavity. The tissues about the cavity were red and boggy.

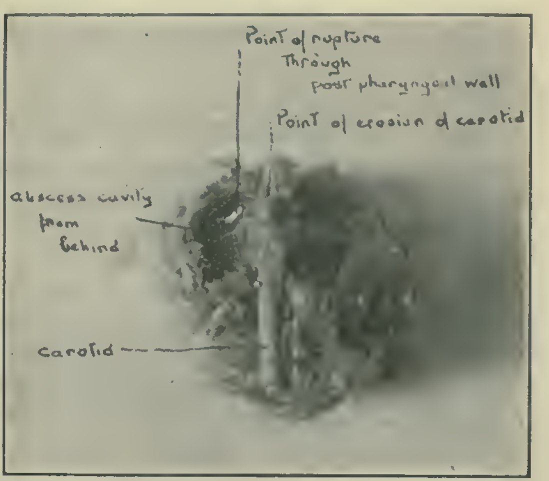

FIG. VII.

A section made of the tonsil on the side of the abscess showed no inflammatory change. The muscle wall of the tonsillar fossa was intact and thick. The abscess was, therefore, definitely retro-pharyngeal and not peritonsillar, and had extended laterally in the posterior compartment of the pharyngo-maxillary space and involved the internal carotid artery.

All of which demonstrates the truth of the maxim of Georges Laurens—"A retro-pharyngeal abscess not diagnosed and not opened is fatal to the child; nearly all treated appropriately, recover."

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THE PATHOLOGY OF ENDEMIC GOITRE

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BEFORE discussing the pathology of the various forms of thyroid enlargement usually known as goitre there are certain general considerations to be dealt with regarding the structure and function of the gland which have an important bearing on the question.

The thyroid is an organ which stands by itself. No other gland resembles it in structure with the possible exception of the pars intermedia of the pituitary. The lung also has certain similarities consisting as it does of alveoli with elastic distensible walls. But of course the air vesicles communicate with duct structures which are absent from the thyroid gland, at least in post-embryonic life. No tissue or organ of the body shows the same specific affinity for an inorganic substance as does the thyroid for iodine. Again, there is no organ in which it is quite so difficult to differentiate increased physiological activities, regenerations, and hypertrophy from true tumour formations, with the exception, possibly, of the prostate gland.

As Marine points out in an extremely useful review of the functions of the thyroid gland (*Physiological Reviews*, Vol. II, No. 4, 1922) more is known about the thyroid, its embryology, its anatomy, its physiology, its pathology, and its pharmacology than is the case with any other gland, but as regards its influence on the various tissues of the body and the inter-relationships of the thyroid with the other endocrine organs we are only at the commencement of our knowledge.

Glands vary somewhat in their capacity to respond to stimuli and to alter structure in so doing. In this respect, also, the thyroid is probably unique in that the response is peculiarly rapid. Moreover, the series of structural alterations or evolutions through which the gland goes, following the stimulation, is always the same. Hence, when certain appearances are visible with the microscope, we can say with confidence that the gland is showing increased activity. There appears an increase in the size of the cells lining the alveoli, so that from being low cubical they become high columnar. At the same time the cells increase in number, and in association with this, the stroma increases and plications appear in the alveolar walls with consequent formation of intra-alveolar papillomatous processes. Coincident with this change is an alteration in the colloid, first it loses its characteristic affinity for acid dyes such as eosin, taking on eventually the basic dye and becoming at the same time granular instead of homogeneous in appearance. Ultimately, the material in the alveoli tends to disappear altogether. During all this period of increased cellular activity, there is an increase in the vascularity of the organ and the whole gland enlarges.

The stimuli which induce this increased activity are various. The following are the more important. First comes deficient ingestion of iodine as shown by the fact that experimental deprivation induces hyperplasia and also by the fact that the administration of iodides in any form prevents such hyperplasia and causes the gland to return to the resting stage should it already be actively proliferating from this cause. Conditions in which there is general malnutrition such as starvation and also such diseases as rickets are accompanied by increased thyroid activity. Certain diets especially those rich in proteins and fats, by increasing the rate of iodine discharge, produce hyperplasia. The influence of the sex glands in the same direction is illustrated by the increased activity of the thyroid in pregnancy and at puberty. Then there is the influence of other ductless glands of which, so far as present knowledge goes, the suprarenal is the most important. The cortex of the suprarenal appears to exercise some control and if this control is removed increased glandular action may result. But a more definite influence is exerted by the medulla of the suprarenal and, indeed, by the chromophil system generally. This influence is of the nature of a stimulation due to epinephrin. Marine and others regard this suprarenal influence as the main factor in the hyperplasia of Graves' disease. Lastly, infective and toxic diseases generally stimulate the thyroid to increased activity and there are those such as McCarrison who regard endemic goitre as essentially an organismal condition primarily of the alimentary tract.

Whether or not permanent alteration in the thyroid structure results from hyperplasia will depend upon the duration of the stimulus. If that is removed the gland will return to the normal in a few days or, at most, weeks. Reversion of the active gland to the resting stage is accompanied by a diminution in the size of the gland cells—they return to their cubical form. At the same time the alveoli fill up with colloid material. Owing to the foldings which developed in the alveolar wall during the active stage the tendency will be for the alveoli on being again distended with colloid, to be permanently larger than before except in so far as new and smaller ones have formed At the same time the vascularity of the organ will decrease and some of the newly formed gland tissue and stroma may be absorbed. But the tendency will be for a gland which has once undergone this hyperplasia to remain permanently somewhat enlarged particularly if the stimulus has been of long duration or repeatedly applied. The great factor which brings back the gland to the resting state is the establishment of iodine equilibrium.

Something must be said about the minute structure of the gland before going on to the discussion of the changes which it undergoes in goitrous enlargement. Two types of cells are distinguished among those lining the alveoli: (1) the so-called *chief cells* which contain large numbers of granules, and (2) the *colloid cells* which contain, in addition to the granules, minute vacuoles of colloid-like material. The granules present in all the cells are known as mitochondria or Altmann's granules. They are lipoid in nature and stain brown with osmic acid. They are rare in the foetus and increase with age. They also increase in number with increased glandular activity but their number bears no relation to the pharmacological activity, *i.e.*, to the amount of active iodo-thyreo-globulin being produced. In contrast to what is found in the case of other granular gland cells, the mitochondria of the thyroid are most numerous between the nucleus and the free margin of the cell. Further, what is known as the Golgi apparatus —a protoplasmic reticulum—is also present in the majority of cells between the nucleus and the lumen. Only in one cell in 500, it is stated, does this reticulum occupy the usual position between the nucleus and the basement membrane. This, in the case of a majority of the thyroid cells, indicates what has been called reversed polarity. That is to say, most of them secrete not towards the alveolus but towards the blood. Secretion towards the lumen only comes into play when thyroid material is being produced in excess of the body needs, *i.e.*, is being stored. This reversed polarity is observed only in the thyroid although the gaseous interchange in two directions in the lung alveoli may be regarded as somewhat analogous.

In the stroma of the thyroid there have been observed groups of undeveloped thyroid cells. These are regarded by Wölfler as being embryonic rests which are capable of forming new thyroid tissue should the necessity for it arise and which it is generally admitted give origin to the so-called adenomata so characteristic of one type of goitrous enlargement.

Here a word must be said about regeneration of thyroid gland tissue. All glands possess the power to regenerate in greater or less degree after partial destruction or removal. This is very marked in the case of the liver as for example following the destruction of acute atrophy. Given time, *i.e.*, if the patient lives, the liver can regenerate itself from its isolated remnants almost completely. The thyroid also possesses this regenerative capacity in marked degree. Marine states that in the dog if three-fourths of the gland are removed regeneration will take place from the remaining fourth. It is interesting to note that the administration of iodine will prevent such regeneration. Regeneration, as also hypertrophy and hyperplasia, will not occur until the iodine store falls below a certain level (0.1 mgm. per gm. dried gland).

Following destruction and degeneration of the gland as in thyroiditis, regenerative areas are often met with. Such nodules of regeneration are extremely difficult to distinguish from the so-called adenomata. Indeed, it is questionable whether most of the adenomata which form so marked a feature of a certain type of goitre are not in reality nodular areas of regeneration.

The thyroid is rich in vessels, both blood and lymphatic. It is usually stated that the iodine-containing hormone passes from the alveoli into the former and not into the latter. The gland is also richly supplied with nerves all of which apparently belong to the sympathetic system. They are distributed to the vessels and to the base of the gland cells. There is, however, no direct evidence that secretion is under nerve control. A point against such control is that thyroid tissue transplanted to another part of the body of an animal responds to stimuli in the same way as does the original gland.

We may define goitre as a more or less permanent enlargement of the thyroid gland. Such a definition would, of course, exclude the temporary enlargements of puberty and pregnancy. This enlargement may be brought about by stimulation in some of the ways cited, but two types stand out above the others, (1) so-called endemic goitre which is met with in limestone areas and is fairly generally admitted as being due to iodine deficiency, (2) exophthalmic goitre, a condition due to over stimulation of the gland by factors as yet imperfectly understood but which many regard as intimately associated with the functions of the suprarenals. It is with the former condition, one which is peculiarly interesting to all inhabitants of the Great Lakes Basin, that we are especially concerned with to-day.

At one time many types of goitre were distinguished according to the morbid anatomical changes found, for example parenchymatous, cystic, interstitial, calcareous, etc. It is now generally admitted that these so-called varieties do not develop independently of one another but represent stages or metamorphoses through which all goitres may pass. Very often several of these stages or metamorphoses are present in one and the same case. So constantly are these types, stages, and alterations intermixed that classification becomes extremely difficult. Three types, however, stand out fairly clearly:

(1) Parenchymatous goitre representing the stage of active stimulation when colloid is deficient or absent, most typically present in the exophthalmic goitre,

(2) Colloid goitre corresponding to the resting stage to which the gland returns on the removal of the stimulation,

(3) Adenomatous goitre in which tumour-like masses of regenerating or neoplastic tissue occur.

(4) True tumour formation either simple or malignant.

The types most usually met with either as sporadic or endemic goitre are the colloid and the adenomatous. At the same time it is not unusual to meet with areas of parenchymatous change in these two common types.

Superadded upon the two common varieties are certain complications of which cyst formation, haemorrhage, necrosis, and calcification are commonest.

The tumour formations require some further attention. As stated, simple adenomata very commonly complicate the colloid goitre. They are called adenomata, but it is exceedingly difficult to distinguish them from nodular hyperplasia and areas of regeneration which also occur in goitre. Two types of these tumours are distinguished, viz., (1) the foetal adenoma, which as its name indicates, resembles the foetal thyroid in appearance, the gland acini being minute, containing little or no colloid and the stroma small in amount (2) the colloid adenoma which resembles the resting gland in structure and is differentiated from it only by the fact that it is intruding itself and pressing aside the surrounding gland tissue. These tumours are regarded as originating from the thyroid rests, already mentioned, which exist in the stroma of the normal gland, but they may arise from any thyroid gland cell. As an explanation of the variation in type it is suggested that the rests have reached different stages of development. One which is still in an embryonic stage will, if stimulated to proliferation, develop into a foetal adenoma, whereas one which has progressed further will produce the colloid type. It is interesting that the foetal type may or may not be able to take up iodine as does the normal thyroid gland cell, whereas the colloid behaves in this respect exactly as does the normal thyroid tissue. On the other hand, malignant adenomata do not take up iodine at all. Little need be said about these last as they occupy a position by themselves. They may form solid masses of cells (spheroidal cell carcinoma) or they may develop acini. Some are relatively simple in that they do not appear to metastasise readily, while others produce secondary deposits sometimes with a marked affinity for bones.

The complications of goitres require more than a word of notice because the size of most goitres is, in no small part, due to cyst formation and haemorrhage. Haemorrhage is the commonest of these complications and may be due to injury or rise in blood pressure, as from sudden exertion, in the vessels of the delicate stroma. The part which trauma plays is emphasized by the frequent occurrence of haemorrhage in the thyroids of dogs. The bleeding takes place both into acini and into stroma. In the former case sudden enlargement due to formation of a blood cyst may follow. The blood in such a situation disintegrates and is in part taken up by phagocytes. Blood in the stroma leads to a deposit of cholesterine and is followed by fibrosis and often by calcification. Calcareous deposit is usually preceded by a hyaline change in the connective tissue. It occurs in areas of sclerosis often following interstitial haemorrhage and may end in true bone formation. It also occurs in the walls of small vessels in any area imperfectly supplied with blood, or in the media of the larger arteries as a result of senile change. This latter form of calcification is known by the name of Mönckeberg. It is often an accompaniment, it may be actually the cause, of the senile atrophy associated with some cases of myxoedema.

Cyst formation is very common in goitre. Marine would restrict the use of the term to haemorrhagic and necrotic cysts, excluding mere distention of alveoli. This, however, is an arbitrary limitation of the term cyst. The following classification may be given: (1) Cysts due to overdistention of alveoli with colloid. What this is due to is not very clear. It may be caused by deficient absorption or excessive secretion into the alveoli. In many instances, as is suggested above, it is due to the formation of large alveoli during an active stage of proliferation. These, when the colloid returns, become passively distended to the limits of their capacity, forming bladder-like spaces. (2) Cysts due to haemorrhage and subsequent degenerative changes. (3) Cysts due to necrosis. These last may follow haemorrhage or they may be due to interference with blood supply as in the case particularly of an adenomatous nodule. Such a nodule has one or more vessels of supply which tend as the tumour enlarges to become unequal to the demand of the growing tissue. Moreover, the pressure of the enlarging nodule interferes both with the intake and the outlet of blood leading to anaemic necrosis, to engorgement and haemorrhage.

Summing up the situation as regards the mode of origin and history of the enlarged thyroid of the goitrous district the following statements can be made: During periods of stimulation of which the main cause is deficient iodine supply, other causes being alterations of diet, pregnancy, puberty, infective diseases, etc., the gland undergoes hyperplasia. With the passing of these stimuli, the gland resumes the resting state, the colloid returning and distending the now considerably enlarged alveoli. In this way the usual type of colloid goitre is produced. But the gland is not left at rest. The stimuli from different causes are repeated, producing periods of activity followed again by periods of rest. Under this more or less constant state of evolution and involution, in a way that we do not as yet understand, simple tumour formations rise. Thus is produced the adenomatous type of goitre. Areas of nodular hyperplasia and regeneration are produced under like circumstances, but so similar are these to the simple tumour formations of the thyroid that it is practically impossible to differentiate them. At any time in the history of such a gland, from injury or sudden increase in blood pressure, haemorrhage may take place to be followed by cyst formation, fibrous overgrowth, calcification, and necrosis. Through glandular exhaustion, inflammation, or arterial disease, fibrous atrophy of gland tissue may supervene, and myxoedema or an approximation thereto, result.

Pregnancy After Interposition of the Uterus.—Although a successful procedure for prolapse, interposition of the uterus presents a decided hazard to future pregnancy, as is shown by the cases reported by Irving F. Stein, Chicago. Because of the fixation of the anterior wall and fundus of the uterus, only the posterior wall is available for development during pregnancy, and at term the cervical canal is perpendicular to the axis of the inlet. Thus, the pelvic inlet is obstructed by the undeveloped anterior wall of the uterus, and labor results in a tendency to flatten the cervical canal from side to side instead of obliterating it from above downward. With the cervix in this position, rendering spontaneous labor impossible, and the anterior uterine wall fixed to the anterior vagina there is only one rational procedure for the treatment of advanced pregnancy, namely, abdominal hysterotomy.—*Jour. A. M. A.*, Aug. 11, 1923.

SOME UNUSUAL FEEDING CASES

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INFANT feeding in difficult cases is still more an art than a science. Despite the many and varied theories with regard to the etiology of malnutrition, despite the fact that each element of cow's milk has in its turn stood the brunt of the blame for all the digestive disorders in infancy and despite the existence of a copious literature explaining in detail why and how each of these elements blamed is responsible for malnutrition in infancy, the fact remains that we are still largely in the dark as regards the main issue, although here and there a beam of light has been thrown on isolated phases of the problem. Notwithstanding the work of recent years, we have not acquired sufficient knowledge of the pathology of digestion of infancy to adequately classify our cases of athrepsy in such a manner as to give us in each case a key to the solution of each particular problem. We are still, of necessity empirical, and it is the degree in which this empiricism is practiced successfully that constitutes the art of feeding in difficult cases.

Such instances of difficult feeding problems are by no means uncommon in the routine work of most paediatrists. In fact, as paediatrists it is expected of us to have some knowledge and ability in the feeding of infants who fail to thrive on the ordinary formulae usually prescribed for artificially fed infants. There are instances, however, when unusual methods are required in order to bring a difficult case to a successful termination. Such unusual methods are frequently in direct opposition to orthodox methods of feeding in vogue, and often follow no definite set of rules. During the past three years I have had experience with a number of such instances, a few of which I wish to report in this communication.

Case I: Baby G. First seen at the age of three months. She was the first living child of healthy middle-aged parents, there had been a number of still-births and miscarriages due to uterine malformation. The baby weighed 9¼ pounds at birth, was nursed for about a few weeks and weaned. She was put on a simple formula of milk, barley water, and dextri maltose. Progress was very slow indeed, despite the fact that the food fed was theoretically sufficient for its needs. Constipation was very obstinate. For this, cream was added to the formula, ounce by ounce to a total of five ounces per day, without result. At three months the child weighed ten pounds nine ounces, one pound and five ounces above its birth weight. She was pale, long, and thin, had drawn features, she had a large abdomen, was extremely cross, slept very poorly at night, the weight had not varied more than one ounce in six weeks. The stools were absolutely dry, were extremely foul smelling, and never soiled the diaper. All this, in spite of the fact that the child was receiving a half teaspoonful of milk of magnesia and ten drops of castoria in each of seven bottles. In order to produce an action of the bowels at all, the mother, who had been a trained nurse, had to insert a finger in the rectum and break up the hard masses of faeces. Enemas were given frequently, castor oil occasionally. There was no vomiting. The food, when the child was first seen, consisted of cream, five ounces; milk, fifteen ounces; sodium citrate, four grains, oatmeal water, twelve ounces; and dextri maltrose, three tablespoonfuls, together with milk of magnesia and castoria already mentioned.

A diagnosis of congenital dilatation of the colon had been made, the parents had been prepared for an operation and the child for a stormy career.

The physical examination failed to reveal any definite evidences of a megacolon, nor of any other definitely pathological condition. It seemed to me that here was a typical instance where a malt soup mixture was indicated. The child was over three months of age, was constipated, there was no vomiting and the weight was stationary. These have always been accepted as the indications for malt soup mixtures. Accordingly, the milk of magnesia and castoria were omitted, the cream was stopped, and the following simple malt soup mixture prescribed:

Whole milk.......	15 ounces
Water...........	15 "
Flour...........	3 level tablespoons
Malt soup........	2½ " " (4½oz.)—7 feedings 3 hour interval.

The child was contented on this mixture and at the end of twenty-four hours had her first spontaneous bowel action, the stool being soft, smooth and brown. The disposition changed for the better, the child began to sleep well; the constipation was completely cured; and at the end of one week, on the above formula, a gain in weight of thirteen ounces was recorded. Progress was rapid from then on, the child weighed seventeen pounds at six months and twenty-four pounds at a year.

Comment.—This case served to illustrate two points; first, what can be done with malt soup mixtures when the cases are carefully selected, and secondly, that the addition of cream to the food of a constipated child does not always have a laxative effect. My own experience in this connection has always been similar to the result in this particular case, namely, that the effect of cream is constipating rather than laxative.

Case II: Frank F., age 4 months. First child of healthy parents. Weight at birth was 7.4. He was nursed for three months but did not thrive well. When he was weaned, he weighed nine pounds, having gained about two pounds since birth. When first seen one month later, he weighed nine pounds, four ounces. At that time he was being given the following formula:

Whole milk..........	14 ounces
Oatmeal gruel........	14 "
Dextri maltose.......	3 level tablespoonfuls
Four ounces.........	6 feedings—3 hour interval

The caloric value of this mixture was three hundred and ninety or forty-two calories per pound.

The physical examination was negative except, of course, that the child was thin. The Von Pirquet was negative. The difficulty in this case was that the child never took more than two to three ounces of its food. The formula was left unchanged but the interval was lengthened to four hours with instructions to the mother to remove what was left in the bottle at the end of twenty minutes. This procedure had no effect whatever upon the appetite of the child, he continued to take never more than three ounces of food, was never eager for his bottle, and at no time evidenced any signs of hunger. This was considered extremely unusual in a child who had no acute or chronic disease. Still, several very careful physical examinations, including repeated examinations of the urine for pyuria, failed to reveal any evidences whatever of disease. After three weeks of observation and adjustment of the formula given above, practically no progress was made—the child still refused to take more than three ounces of food at a time, and when attempts were made to shorten the interval, he began to refuse some of his feedings entirely. The mother was asked to keep a record of the total daily intake of the child for a period of three days. She reported that the average intake was fourteen ounces per day. The baby was now five months old and weighed nine pounds, fourteen ounces.

It seemed to me that the solution of this difficult and unusual problem lay in giving the child in the fourteen ounces which we knew he would take, sufficient food to cover his growth requirements. Therefore, it was thought advisable to give the following food: eight tablespoonfuls of whole milk powder and three tablespoonfuls of lactose were suspended in fourteen ounces of barley water and fed to the child during the course of the day at four hourly intervals. This allowed a total of four hundred and sixty calories or about forty-five calories per pound. Water was allowed *ad lib.* between feedings. The result was a gain of seven ounces at the end of the first week on this treatment. Whenever the child showed an inclination for more food, which he did very soon afterwards, water was added to the mixture. Soon he was taking eighteen ounces per day—but for three months refused to take more. The strength of the mixture was increased in accordance with his needs. Progress was steady, interrupted only for one week when the child contracted lobar pneumonia. He weighed twenty-one pounds at eleven months and twenty-three pounds at one year.

Comment.—This case is unusual from two stand points; first, because of the rarity of lack of appetite in an infant showing no signs of acute or chronic disease, and secondly, because of the method used in making the child gain in weight. The first formula fed contained twenty-nine calories per ounce, nearly half again as rich as undiluted cow's milk. Yet the child did well on this mixture and on looking back on the case, it is difficult to see how the child could have been made to thrive on anything else.

Case III: Baby H., age 5 months. Was very similar with regard to the lack of appetite. She had been weaned at ten weeks of age when she weighed exactly ten pounds. At five months she weighed eleven pounds, thirteen ounces. Her food, then, consisted of whole milk, twenty ounces, water, sixteen ounces, malt sugar, six tablespoonfuls, divided into six, four hourly feedings. This gave a total of six hundred and forty calories or about fifty-three calories per pound. Here too, the weight was stationary because the child never took more than four ounces of food and many times refused her bottle entirely. Profiting by the experience of the case previously reported, a similar formula was suggested, but this child being very fastidious in her tastes, refused, and could not be made to take dry milk in any form. The same fate met any attempts to give fermented milk with corn syrup, accordingly the child was allowed twenty ounces of whole milk per day, to which was added six tablespoonfuls of malt sugar. This she took well and immediately began to thrive. Gain in weight has been uninterrupted ever since. She is just one year old and weighs nineteen pounds.

Comment.—Here too, we have a case similar to the last one treated successfully along the same lines. It seems to indicate that it does not really matter how concentrated a mixture is fed to a child so long as the requirements of the child are adequately covered. This point will bear further and more detailed investigation.

Case IV: Baby C., age 3½ months. Third child of healthy parents; the other children are well. Weight at birth was 7½ pounds; present weight at 3½ months is only eight pounds. He was nursed for three weeks and weaned at the order of the attending physician because of a failing milk supply. At the age of five weeks he began to vomit after every feeding. The vomiting was never explosive but occurred in mouthfuls, and in small quantities, for a long time after each feeding. Nothing in the history of the vomiting suggested the possibility of pyloric stenosis. The vomiting rather suggested a mild type of rumination, although the characteristic noises and working of the jaw were absent. The bowels were constipated; he was sleepless and always fretful. Up to the age of 2½ months he had been fed on a variety of mixtures including modified milk and numerous proprietary foods. For one month before I saw him first he was fed by a wet nurse, but with no effect on the vomiting nor upon his general condition. He had been nursed at the breast every three hours at first; later every two hours. At this time he was only one half pound in advance of his birth weight. On examination he was a thin, typically marantic infant, extremely unhappy; he had practically no subcutaneous fat. Repeated examinations for gastric peristalsis gave negative results, nor was any evidence of the presence of a pyloric tumour ever found. This was not, then, a case of pyloric stenosis, nor of pyloric spasm, nor was the child very definitely a ruminator. It seemed that this was a typical case for thick cereal feeding. And since there was a wet nurse it seemed reasonable to make the gruel with the nurse's milk. The following formula was prescribed:

Breast milk...............	20 ounces
Farina....................	3 level tablespoonfuls
Cane Sugar................	1 " "

Cooked two hours in a double boiler.

This made a very thick mixture, which was divided into five equal parts, one part to be fed every four hours with a spoon. Atropine sulphate, one one-thousandth of a grain was given a few minutes before each feeding.

The mother reported only a very small amount of vomiting at the end of twenty-four hours on this food. At the end of forty-eight hours the vomiting had ceased entirely. The child was taking the food well and was having spontaneous bowel movements, whereas previously he always required both laxatives and enemas. The first week on this treatment showed a gain of three-quarters of a pound. At the end of six weeks the child's weight is now thirteen pounds, a total gain of five pounds to date. Any attempts to return to liquid food are successful only for the first day or two after which the vomiting is resumed almost with the same degree of intensity as before the beginning of this treatment.

Comment.—This is an excellent example of the effect of thick cereal feeding in a selected case. In this instance there was no definite evidence of stenosis, spasm, or rumination. It might be argued that this was a case of mild pyloric stenosis and such an argument cannot be entirely refuted. Still, granting this to be true, thick cereal is indeed indicated, under such circumstances.

At the end of three weeks on this food several samples of stool were carefully examined for the presence of undigested starch, with negative results.

Case V: Kenneth S., age 2 years; first child of healthy parents. Weighed nine pounds at birth; was nursed for four months and weaned on the advice of the physician, on account of excessive crying. He did well, however, on a whole milk mixture and weighed twenty-eight pounds at the age of eighteen months; his best weight. For the past six months he had been having prolonged attacks of diarrhoea which took his weight down to twenty pounds. The stools were copious and loose; the appetite was very poor; the diet consisted of three meals a day, rather rich in carbohydrates, but was fairly well balanced otherwise. On examination, the child presented all the features of chronic intestinal indigestion. He was thin, his features were drawn, he had a large, very prominent abdomen. The child was considered a case of coeliac disease and treated as such, namely, he was put on a pint of fat-free lactic acid milk per day and given a diet rather rich in proteins and poor in fat and carbohydrates. No improvement was made on this treatment during a period of six months. While this was not at all unexpected in a case of coeliac disease, it was observed that the stools constantly contained large quantities of undigested milk curd. The quantity of milk was accordingly reduced to minimum amounts, and it was noticed that however small the quantity of milk allowed, the curd continued to appear in the stools. This suggested an inability on the part of the child to handle milk and, therefore, a milk-free diet, well balanced, was prescribed with the astounding result of an immediate improvement in the general condition of the child, in his disposition and in his weight. For the past eighteen months this child has not received one drop of milk in his diet.* He has gained over eight pounds. He is doing remarkably well. Any attempt, even to-date, to include milk custards, milk puddings, or junket in his diet invariably causes a looseness of the bowels and the re-appearance of curds in his stools.

Comment.—This case is not strictly speaking one of infant feeding. Still it presents a problem which is rather unusual and for this reason only is included in this group. The condition was probably one of indigestion rather than allergy. Several skin tests made with cow's milk protein were negative. Moreover, the child did well on cow's milk from the age of four months to the age of eighteen months.

A variety of difficult and unusual problems in the feeding of infants have been presented. They serve to illustrate that fixed rules cannot be followed in their solution, but that each case must be treated entirely upon its own merits and in some instances not only upon original lines but by methods which frequently diverge considerably from accepted forms.

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*Attempts were made in this case to add calcium caseinate in order to supply the calcium deficiency of a milk free diet. As this too led to digestive upsets, the deficiency was overcome by the addition of small doses of calcium chloride.

Insulin in Tissues Other than the Pancreas.—C. H. Best and D. A. Scott, Toronto, have been able to prepare active extracts from the submaxillary thymus and thyroid glands and from liver, spleen and muscle tissue. These extracts have been repeatedly tested on normal rabbits and have consistently produced a marked lowering of the blood sugar of these animals. A large dose produces typical insulin convulsions in the rabbits. The convulsions are alleviated by the administration of dextrose. The number of units obtainable from 1 kg. of thymus or submaxillary gland tissue exceeds that originally obtained from pancreatic tissue. This yield is, however, only a small fraction of that obtained when pancreatic tissue is treated by the present procedure. The authors have secured results which tend to indicate that this substance, which we believe to be insulin, is excreted in somewhat greater amounts by pregnant women than by normal men. Insulin is present in every tissue they have investigated.—*Jour. A. M. A.*, Aug. 4, 1923.

A Possible Mistake in the Diagnosis of Gonococcal Infection of the Kidney.—The case reported by Charles H. de T. Shivers, Atlantic City, N. J., shows how easily micrococcus caterrhalis infection of the kidneys could have been mistaken for gonorrhoea had not a careful bacteriologic study been made. The morphology of the gonococcus and of *Microcococcus catarrhalis* are practically identical. No one can safely differentiate them by morphology and staining.—*Jour. A. M. A.*, May 12, 1923.

ADDRESS IN SURGERY*

L. J. Austin, M.B., F.R.C.S. (*Eng.*)

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I FIND it is usual in the presentation of this address to take up some definite subject of special interest or refer to the more prominent discoveries and advances of the last year. The range of subjects under the head of surgery is so vast that there is ample scope for choice, the very size making any selection only the more difficult. I have myself chosen to present to you to-day some observations in the education and training of a surgeon. I feel that no excuse is needed for the choice I have made, as it is my own work at Queen's University to lay the foundation stones for, I hope, many brilliant and successful surgical careers.

Examinations.—I will commence with the consideration of a most unpleasant part of all educational systems—I mean examinations. The system is admittedly very far from perfect as a test not only in medical subjects but in all branches of education, but the human brain has not yet managed to evolve any method by which examinations can be eliminated. It is said that the Chinese first introduced the system for Civil Service appointments, and thereby invented an aristocracy of tradition and learning however narrow it may have been. It is not my purpose here to trace in any great detail the gradual rise of surgeons and surgical art through the tortuous paths of the barbers, and in spite of the bitter hostility of the physicians through many ages, or to follow the rise in dignity and position of our craft which is so closely associated with the development and increasing importance of military urgency.

After the fall of the Roman Empire medical and surgical knowledge retired to Constantinople, and as the Eastern Roman Empire grew more and more impotent, learning was mainly absorbed and increased by the Arabians and spread with the rise of Mohammedanism throughout Eastern Europe, Asia, North Africa, and Spain. This medical knowledge which was at a much higher level than anywhere in Europe gradually filtered back again with the Crusades, and by the trading established across the Mediterranean. A very little is known about the actual surgery of the Crusades and the famous military medical orders of the Temple and the Knights of St. John soon fell away from the original intent of nursing and aid to the pilgrims and became much more military than medical and exercised a political and financial power which was to lead to their ultimate downfall. Towards the end of the period of the Crusades and marking the very earliest period of the Renaissance there arose in Sicily a truly remarkable and liberal minded man, Frederick II, Emperor of the Holy Roman Empire: Frederick, *stupor mundi!* the wonder of the world!!

He was a great patron of the liberal arts and sciences and at the University of Salerno established a medical school and instituted the system of examinations for diplomas. Frederick's edict required that candidates for license to practice must be properly examined in public by the Masters of Salerno, the license being issued by the Emperor himself or his representative. Failure to comply with the statute by unlicensed practitioners was made punishable by a year's imprisonment and forfeiture of property. The examinations were based upon the genuine books of Galen, Avicenna and Hippocrates and before taking it the candidate was required to have studied logic for three years, medicine for five years, and have practised for one year under some experienced physician. The candidate in surgery had also to give evidence that he had studied the art for at least an extra year, in particular, human anatomy, "without which," as the statute states, "no incision can be safely made, nor any fracture treated." The physician was required to treat the poor for nothing, to visit his patients twice a day, or once at night, to avoid collusion with apothecaries and to inform upon them if they adulterated or substituted drugs. Office fees were fixed at thirty-five cents, out of town visits three dollars, while operations varied from $20.00 to $200.00, and in cases of wealthy patients a life annuity was paid the operator as well. When we consider that money was worth fifteen to twenty times as much in those days as it is at present, our ancient brethren seem to have been paid reasonably well. The sale of poisons, magic potions, and aphrodisiacs was punishable by death if any person lost his life thereby: food, drugs, and apothecaries' mixtures were examined at stated intervals by inspectors. Such regulations were adopted by other States, but were never carried out: the world was not ready for such a sweeping reform, and we have not yet reached a position as outlined above. The surgeon does not receive an annuity as well as a fee for his work: the irregular practitioner is almost encouraged instead of being thrust into prisòn: the trafficker in opium and cocaine would, I feel sure, be more seriously deterred from his trade if a life penalty followed any disaster. We still have to maintain inspectors for food, and have trouble in establishing a standard of purity and strength for the drugs in common use.

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*Read at the Annual Meeting, Ontario Medical Association, Windsor, June, 1923.

The examinations held in those old days and carried on for many years in the great semi-monastic universities of Europe were held in public and were mainly oral: the written paper was a curse to come later. For several centuries, however, in spite of the universities, and in spite of many famous surgeons and anatomists, it must be admitted that surgery remained in a very degraded condition. In the words of William Clowes, himself a surgeon of repute, we can see from what lowly state we have originated, and how the practitioners of the art were recruited. He says of his fellows: "they are no better than runagates and vagabonds, shameless in countenance, lewd in disposition, brutish in judgment and understanding." In another place he complains that the art was mainly practised by "Tinkers, tooth-drawers, pedlars, oslers, carters, porters, horsegelders and horseleaches, idiots, applesquires, broom-men, bawds, witches, conjurers, soothsayers and sow-gelders, rogues, rat-catchers, runagates and proctors of spittle houses."

The art of surgery remained in the deplorable state until the middle of the eighteenth century when organization and the formation of colleges and guilds under Royal Charter rapidly occurred in the civilized countries of Europe, starting first in France under Louis XIV and in England about 1740. From this time onwards the principle of examinations has been well established and many attempts, most of them unsuccessful, made to compel all in the healing art to conform to the regular channels.

The Anglo-Saxon race has a peculiar tendency to cling to its old regulations and the whole of the evolution of law is built upon a slow modification of existing enactments. In no branch is this more clearly brought out than in the evolution of examinations and licensing bodies for medical and surgical practice. In the Old Country, in addition to the older and younger Universities, we have the various Royal Colleges of England, Scotland, and Ireland, acting as examiners and grantors of degrees, and at the same time various much less important bodies like the Society of Apothecaries still cling to their ancient rights and issue a few not very important diplomas. Any attempt to combine these various bodies and establish a more uniform and standard examination is at once met by all the powers of tradition and vested interest which immediately hold up any often much required reform. Here in Canada, as far as I am able to understand, the same process of evolution and regulation to meet existing conditions have drifted on until we have arrived at the present admitted duplication of examinations. Surely a university examination should be enough! Would it not be possible to combine the function of the provincial and Dominion examining boards to prevent reduplication. The ideal seems to me to effect such an amalgamation of the various provincial interests that a single examination of high standard conducted at the medical schools and universitites of the Dominion should carry a license to practice in the Dominion, and by cross registration in the various sections of the British Empire. To effect this it would be necessary to have outside examiners appointed to assist at each of the colleges and universities and representatives from the Dominion and, if necessary, the provincial authorities, to see that the standards are sufficiently high. The cross examining system is always used by the universities in England. For instance, when I took my Cambridge degree, only two of the eight examiners were appointed from the staff of the University. The General Medical Council of the United Kingdom is legally responsible to His Majesty's Government that the standard of examinations is kept at an adequate level and that body constantly sends representatives to draw up reports upon the efficiency of the various licensing bodies. I know full well and fully appreciate the difficulty of language and distance in this great Dominion, but even if this is insuperable over the whole of the country, could not a province like Ontario make a start? I hope to see the day when the final examinations of Toronto, London and Queen's are held upon the same day, with the same standards—with cross examiners from each of the schools and with a completed university degree and license to practice all at once. As you all know the provincial authorities of Quebec already permit the graduates of McGill University to proceed to the provincial license without further test than their university degree examination conducted under supervision by the provincial authorities. So it can be done.

Curriculum.—The next aspect of medical education in this country to which I mean to refer is the tendency within recent years to lengthen the curriculum and thereby the number of years required for the medical student. I will here quote from the newspaper report of a speech by the Hon. Dr. A. E. Ross, delivered in the Dominion House on Friday, May 25th: "In our school system we have been dominated by the influence of the United States, and to-day the boy of poor parents is practically cut out from the technical courses. In my time a boy could take four years in medicine and graduate. In the past we have had some very, very, successful physicians as the result of that four years' training. During the four years the boy was able to go out and earn money to put him through his course. Personally, that was my experience. I had to put myself through college and earn the necessary money to do so. To-day, the course takes six or seven years. This is altogether due to the influence of the United States, to our trying to imitate their system. With the lengthened course the term has also been extended so that the boy has very little opportunity of earning his expenses, and consequently the boys of poor parents are practically excluded from these branches of study—all because of the influence of the United States over our school system.

"Then, too, we have come under the influence of the United States in the standardization of our hospitals. And what has it cost us? We have followed their advice under the Rockefeller Foundation and have built up hospitals according to their standardization. This has resulted in a very expensive system of hospitals, a system not at all intended for our use, a system where the poor man has to attend the public wards and take the doctors in those wards, and all simply to fulfil American ideas of standardization in hospitals."

Although all of us will not agree with the Hon. Dr. Ross that the length of the curriculum is entirely due to American influence we will all agree with the very serious financial aspect for the boy who desires a medical education. With the shortened summer recess and the very marked increase in the difficulty of getting remunerative work during the last two summers in this country, owing to the post-war depression, I have come across many cases of boys who are finding great difficulty in financing their last two years and are leaving for practice with a serious burden of debt to pay off, in many cases to their companions and even their landladies. I think we must admit that there is another factor at work in increasing the length of the curriculum beside the American standards, and that is, that the boys have got to drive into their heads every year and year by year just a little more knowledge to satisfy their examiners, and there is a physiological limit to the receptability of the human brain. Even in the comparatively few years during which I have been qualified, such discoveries as the causal organism of syphilis, the application of the bulk of serum therapy, practically the whole of the special subject of genito-urinary surgery, blood chemistry, etc., etc., have all developed and all are made subjects of examination for students. The limit has got to be set some day and that fairly soon as the subject advances, and some scheme will have to be worked out to make and qualify a medical practitioner, not actually dangerous to the public. I cannot, therefore, entirely agree with the Hon. Dr. Ross that the change from four years to six or seven years is due entirely to the American control, although this factor has an important bearing on the condition. Also, we must remember that a large number of our students and graduates are accepted as *internes* and not infrequently settle as practitioners in the neighbouring country, and that State may, therefore, feel entitled to a say in the education of its absorbed citizens. While this is so, I cannot see that the organized profession in the Dominion could not settle its own affairs and set its own standards without accepting money from the States, which money is accompanied by a certain amount of dictation of policy.

The length of the curriculum makes us ask ourselves whether there is not an undue prominence placed on the preliminary subjects as opposed to the more definitely strictly medical work. There has been a tendency to add more and more courses to the whole, and while time has been added by years also, certain other parts have suffered from cuts in their allotment.

Let us consider some of these subjects separately:

(A) *Anatomy.*—I find, on the whole, that this truly important subject has not as much time devoted to it in this country as in England. More especially not nearly so much importance is attached to anatomy in the final examination as across the water. Personally, I feel that anatomy is all essential for a man who is training for a surgeon, and that it is incumbent in every young surgeon who is fortunate enough to be settled near a school of anatomy to obtain a demonstrationship and keep it up by teaching. The teaching of anatomy has passed away from the surgeon in practice and has become a special academic subject, with the result that a quantity of comparatively useless knowledge is demanded of the student and the training is scientific and bears little relation to the anatomical problems of practice in fractures, sepsis and general operating. Anatomy as I have said has suffered by the insistence of its rivals for more time and I feel strongly that any further cut in anatomy is positively dangerous.

(B) *Physiology.*—Also a fundamental subject, seems to have got a bit off the lines and the student is only too ready to throw away his physiology note book when he reaches the wards. Perhaps here, too, the subject is too academic and not sufficient trouble is taken to point out the intimate bearing of the observed phenomena upon disease.

(C) *Pharmacology.*—As an allied subject is comparatively new as a separate course and requires much time and application for its adequate study. Although much scientific medicine is based on pharmacological research, the insistence of this subject for a regular course to students has many opponents.

(D) *Chemistry.*—Is unquestionably a fundamental subject but I am certain that too much time and labour is spent upon it. Certainly the average medical student when he reaches the time for graduation, and more certainly still, the average practitioner, and most surgeons, remember but little and care less about the chemistry of the youth. It is stated that it is a valuable training like Latin and algebra and all the other things we automatically forget. Perhaps so, but can we afford a year or a year and a half in learning a subject just to forget it? Perhaps another year at anatomy would be a very good training and might leave behind it some knowledge of future use to the man who has to learn it.

(E) *Biological Chemistry.*—Is of immense importance for the laboratory worker and is at present, as we all know, offering on the research side a wide field of accomplished results and opens up a vast range of hope for the future. I suppose I should be ashamed to say that although a surgeon I cannot remember the formula for uric acid and if I want a blood sugar reaction done I send it to the man in the laboratory who has made a special study of this subject. So do you!

(F) *Physics.*—Here again we have a subject that is necessary for the surgeon but only slightly if we are honest with ourselves. It mainly applies to the X-ray apparatus and care of small electrical outfits like the cystoscope and how to start a car on a wet night in mud forty miles from home. I certainly feel that enough physics could be taught at school before entry into the university.

(G) *Pathology.*—Here is, indeed, a subject that ranks with anatomy in importance for the surgeon. It is mainly by pathology, histology, and morbid anatomy that we can form a just estimate of the disease it is our duty to combat. Viewed in the light of our teaching, "How do we die?" It is a common taunt and accusation by the physical expert and the nature healer, the Christian Scientist, and all the faddists, that medical and surgical diagnosis is often incorrect and proved incorrect in the post-mortem room, the temple of truth. Alas it is so, but if we, with our special training in morbid anatomy are liable to gross error, what about the nature healer and other irregulars. They have no chance of learning the cause and the effect—no man should be allowed to pose as a healer without a special course in post-mortem work that he might be instructed in that most important of all human studies, a knowledge of how we die. An adequate appreciation of the causes of death is the only possible training for a man whose main function is to combat that dread enemy.

You will thus see from these few observations, that, in my opinion, the strictly medical subjects have suffered by the competition of the more scientific and academic aspects of medical education. I should like to see more responsibility for these thrown back on the schools, and the medical curriculum reduced in the universities, thus giving more time for post-graduate instruction and the evolution of a system for training specialists in the various branches of medical and surgical art.

SOME RESULTS OF RADIUM TREATMENT IN SARCOMA*

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THE results of treating sarcoma are not uniform. Surgical procedure is very often closely followed by recurrences, and metastases are the rule rather than the exception. The results in the treatment of certain cases of sarcoma with radium, however, have been so successful as to warrant a report, and I shall give details of certain of these later in this paper.

The effect of the use of radium on sarcoma cells histologically was investigated by an associate of the writer in 1913. A myeloid sarcoma of the tibia which formed a secondary deposit in the groin was diagnosed microscopically by biopsy, and was then submitted to a heavy radiation. Ten days later tissue was removed for examination. The large cells of the growth under the influence of the rays had changed to smaller connective tissue cells and spindle cells. The cells showed necrosis and necrobiosis. The connective tissue cells had been mobilized and the leucocytic infiltration was most intense.

Dominici describes the changes which take place after radium treatment of a very vascular myeloid sarcoma. He considers that the malignant cells are not only destroyed by the action of the rays and replaced by fibrous tissue, but that the sarcoma cells themselves were converted into cells indistinguishable from normal connective tissue. The protoplasm of the giant and sarcoma cells became replaced by connective tissue fibres which, Dominici believed, arose from the alteration of the protoplasm itself. The lumen of the blood vessels became smaller so that they appeared like capillaries lying in the midst of fibrous tissue. It seemed that the malignant sarcoma cells were transformed into fibrous cells. The fibroma-like structure remained stationary or became smaller showing no tendency to increase as in ordinary fibromata. The arrangement of the connective tissue fibres was remarkably regular.

In the treatment of sarcoma it is necessary to avoid, if at all possible, any breaking of the investing skin, for, if such should occur, it involves the possibility of haemorrhage and septic infection. For this reason, in most of the cases subsequently cited (except where mention is made to the contrary) there has been no pathological examination of tissue, but diagnosis has been made entirely on clinical evidence. For deep seated growths I make use of the gamma rays of radium, employing flat, heavily screened applicators over the mass, the dose varying in intensity in proportion to the extent and location of the lesion. In superficial sarcoma, however, beta rays are more satisfactory. Tubes and flat applicators are used in such cases, as I consider them superior to needles.

I have not had encouraging results with lymphosarcoma. This condition, however, bears a very close resemblance to lymphogranuloma, and we have found that the latter disease responds most favourably to radium rays. It is possible, therefore, that diagnosis may in some cases lie between these two, and our good results in lymphogranuloma may have been really cases of lymphosarcoma, and *vice versa*.

Cases of osteosarcoma are generally very unsatisfactory in their response to radium, with certain striking exceptions. For example, sarcoma of the palate has responded very satisfactorily in many instances. Epulis, also, and myeloid sarcoma of the bone, are most suitable for radium treatment. I treated one case of epulis in April, 1920, and there has been no recurrence. Another patient came to me in April, 1919. She had been operated on eighteen months before, and the condition had recurred three months later. Radium was applied in April, 1919, and again in May of the same year. In November, 1922, over three years later, there was still no evidence of the disease. A third patient came to me in November, 1922, for an epulis between the lower incisors. A pathological report on the tissue showed it to be a reticulated adamantinoma. She had had the condition operated upon some years previously. Radium was applied in November and there has been no return up to the present.

Another very interesting case of osteosarcoma is that of Mrs. P., aged 43, who had an osteosarcoma involving the right temple. It first appeared in June, 1914, and she reported to me in December of the same year. There were no eye symptoms, and the condition caused no pain, except in stooping. There was distinct bulging of the right temple over an area about two inches in diameter. The temple was radiated with well screened radium plaques at two month intervals for a year, once in the following year (1916) and twice in 1917. In November, 1922, she reported to me, and there was no appearance of disease, the condition having remained clinically cured for five years.

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*Read before the Annual Meeting of the Ontario Medical Association, held at Windsor, June 1st, 1923.

One of the most unsatisfactory types of sarcoma in its response to treatment is the melanotic variety. The local lesion may be entirely cleared up, but the prognosis in almost every case is not good, as metastases occur practically inevitably. Radium, however, is often able to hold the disease in check for some time. I shall report four cases of this condition, three of which resulted fatally. Mrs. C. came to me in September, 1910, for treatment of a small black nodule on the left cheek. Treatment was given in September, October, and November of that year, after which time the lesion seemed quite healed, and the patient did not return. She died in August, 1912, after metastases had developed in both groins. A second case, Dr. R., presented a pigmented mole on the right side of the abdomen in April, 1917. The pigmentation had been present for years, but had begun to spread. Radium was applied and the lesion healed completely. One year later a development appeared near the site of the original lesion which was removed surgically. Very soon after a further recurrence was removed surgically. Later a gland in the groin was removed. In January, 1920, a recurrence in the abdominal tissue was removed surgically. Further developments followed rapidly, and the patient died in May, 1920. A third case which resulted in an equally unfortunate manner was that of Mrs. W., aged 36, who had a mole on the back removed in 1920. It recurred and was operated on a second time in the fall of 1921. In April, 1922, she noticed a mass in the left axilla about one inch in diameter, also a small node in the gland on the right side of the neck. She came to me in June, 1922, and radium was applied. She reported at monthly intervals for three months. Each time there were new nodular developments. In January, 1923, she died. These three cases show the usual course taken by melanotic sarcoma. An encouraging case, however, is that of Mrs. R., who came to me in June, 1914, with a small dark spot on the left cheek. She had had it excised two weeks previously, pathological examination showing it to be melanotic sarcoma, and this operation was followed by recurrence. Radium was applied over the area in June and again in July, 1914. There had been no recurrence up to November, 1922.

The effect of radium in the treatment of angiosarcoma has been most satisfactory. In the case of a girl of sixteen a small rapidly developing tumour was to be found on the right of the bridge of the nose, caused, presumably, by irritation from glasses. It had developed in the course of a month. Radium was applied in May and June, 1920, after which treatment the lesion disappeared entirely, and has not recurred. A second case is that of Mr. S., aged 53, who presented a cystic angiosarcoma over the right ear. The lesion had been present since birth, and had gradually increased in size. It had twice been removed surgically, the last time being eight years before he came to me for treatment. Three months before he reported to me it had recurred. When I first saw the lesion, in October, 1921, it was a raised mass, irregular in shape, about one inch in diameter. He received radiation over the lesion in October, and November, 1921, and also in January, February, and March, 1922. At the end of this time he was free of disease, and there has been no tendency to recur.

Sarcoma of the conjunctiva responds most remarkably. I have had several very outstanding cases. Mrs. B., aged 60, noticed a small black pimple on the left eyeball in October, 1919. She sought advice and was told that it would be necessary to remove the eye. Just before consenting to this, she was sent to me for radium treatment in order to try to save the eye. Heavy radium exposures were given over the growth in December, January, and February, and when seen in March there was no evidence of disease. She has remained in excellent condition, and there has been no occasion to remove the eye. Another very excellent testimony as to the value of radium in this condition is the case of Mrs. H., aged 39, who had a sarcoma of the conjunctiva which had been present for one and a half years. In June, 1919, the growth was removed surgically, and post-operative radiation was given. Radium was applied to the conjunctiva at monthly intervals until October, 1919, after which time the condition was considered most satisfactory. The patient reported in April of this year, approximately four years after receiving treatment, that there had been no recurrence of the disease.

Three other cases of sarcoma are particularly interesting: Case No. 243, Mr. R., was first seen by me in September, 1911, when he consulted me regarding a growth in the right orbit which caused a protrusion of the eyeball. It had been diagnosed by several men as an inoperable sarcoma. Radium, heavily screened, was applied over the temple at varying intervals for about a year, at the end of which time the disease seemed well in check. No further radiation has been necessary, and when the patient was last seen, in June 1922, there was no evidence of the disease. That is to say, the condition has remained clinically cured for over ten years.

Case No. 1936, Dr. S., aged 35, had first noticed shooting pains in his left knee joint, in August, 1918. These continued, growing gradually worse, until May, 1919, when he was quite lame. At this time there was an elastic swelling in the popliteal space. It was diagnosed as a bursitis of the tendon of the semimembrancsus muscle. The swelling subsided readily under rest and pressure. In June of the same year, he was operated upon for removal of the bursa, when a hard mass, the size of a lemon, was found and removed. The pathological finding showed spindle-celled sarcoma. Another report named it "melanotic sarcoma?" There was no further trouble until March, 1920, when a recurrence appeared at the site of the original tumour. There was no pain or discomfort in the area. Three weeks after discovering this mass the patient came to me for radium treatment. At this time a specimen of the tissue removed in June, 1919, was sent to Professor James Ewing for examination. In his report of the tissue he stated that he considered it a very rare and interesting condition, and that he had only seen two other cases like it. He termed it a "xanthosarcoma," stated that it was only slightly malignant, and described it as being very similar to the giant cell sarcoma of the epulis type occurring in bone. He considered that the tumour might be safely removed and might not recur, although it had already reappeared. He advised the use of radium. Radium plaques, heavily screened, were applied over the mass at intervals during April, May, and June, 1920, giving in all 518 milligramme hours. A further slight exposure was given in October and again in December of the same year. I have had reports of this case from time to time, and to date, three years after treatment was given, there has been no recurrence.

Case No. 3171, Mr. C., aged 18, fell, on October 18th, 1922, injuring his right leg slightly and bruising the left leg below the knee. Rapid improvement was noted in the injury to the right leg. In November he noticed a lump the size of half a hen's egg at the site of the bruise on the left leg. This lump caused him no pain, it was soft and smooth in outline, and the skin over the tumour was normal. In a week's time the growth was seen to have increased in size, there was a definite lip-like appearance at the lower part of the mass and a cord of hard tissue was palpable, running from the lower margin towards the centre. Operation was advised and carried out on November 29th. The mass was found to be soft, haemorrhagic and attached to the periosteum but not involving the bone. Frozen section showed spindle cells with very little intercellular substance and a provisional diagnosis of spindle celled sarcoma was made. Later, paraffin sections indicated that the growth might be a rapidly developing endothelioma. At the time of operation, three ten milligramme tubes of radium were inserted in the wound, on the bone, the location of the tubes being changed from time to time to cover the entire area of attachment of the growth to the bone. One thousand four hundred and forty milligramme hours of radium were given. The stitches were removed on December 14th, and it was decided to give radium over the site of operation and X-rays from three inches below the patella up to and including the groin. This was, accordingly, done. On December 16th and 23rd, 1,460 milligramme hours of radium were given over the site of operation. The present condition, six months after operation, shows no evidence of recurrence. On account of the thinness of the flap, an ulcer at the centre of the wound developed, which extended down to the periosteum. No bare bone was discovered. At first the ulcer was the size of a fifty-cent piece, but it has gradually diminished to that of a ten-cent piece. His present condition is excellent. He has gained some thirty-five pounds since the accident.

These results are some indication of what can be done by the use of radium in sarcoma. Although it is often of little benefit, the good results often obtained undoubtedly justify its use in this condition.

MEDICAL EXPERIENCES AMONG THE KWQUITHLIH INDIANS ALONG DISCOVERY PASSAGE, B.C.

William Fyle Shaw, M.D.

Campbell River, B.C.

DISCOVERY PASSAGE lies to the south side of the Seymour Narrows, over a hundred miles north of Vancouver. This passage is historic, as named by Captain Vancouver on his voyage of discovery in 1791; Cape Mudge, one of the Indian reserves is named after his lieutenant.

The central point for these Indians is Campbell River, a point on the Island just thirty miles from Nootka, first settlement on the western coast, well known to history by the exploits of the famous chief McQuinna, who in 1803 captured the good ship *Boston*, killing all on board but John Jewitt, whom he held captive three years, and whose narrative is still extant.

The tribes of this division are Wewayakium, Campbell River, Wewayakay, Cape Mudge, Kweahkahs of Quathiaska Cove, Wawlitsum, of Salmon River and the Homalco, Kliahoose and Sliamon bands, numbering over a thousand, the remnants of the thousands once living along the B.C. coast.

In the year 1916, March 3rd, I came to this district to take charge of the hospital at Campbell River, a centre also of logging camps, and was appointed Indian Physician by the Canadian Government.

I immediately assumed my duties. The field was practically virgin soil, the labours of a physician for a few months only preceding mine. I well remember my first trip to the largest village. A large Potlatch was in progress, and amid the beat of the drums and the gambling, I approached the tent of a sick visiting chief. He had contracted pneumonia, probably due to the great congestion of Indians, and was suffering severely; I applied treatment and gave medicine and started to return. Immediately I was beset on every side by the sick and maimed, old men with sightless eyes asked for restoration of sight, palsied limbs and tumours cried for relief. Not possessing the miraculous power seemingly demanded by these importunities, I was glad to escape and return home. From that time on I was initiated, and many variegated experiences succeeded one another.

On one trip soon after, I went to see Jim Nuknuk, father-in-law to chief Billie Assui, diagnosing an old blood condition—lues. I gave pot. iodide grs. 10 four times a day. Evidently there was an idiosyncrasy in this case, for next day I was summoned in great haste, and found the noble chief unable to see, the face swollen, and he showed other signs of distress. I was stoutly accused of poisoning this man, and beginning to be apprehensive, I explained the action of the medicine, "very bad sick, too long sick, medicine too strong," and stated that if they believed my intent to poison, surely they would refuse to take any more medicine from me. However, this phase of affairs did not appeal to them, as finally they said the evil spirit had been charmed out of me, accordingly I gave the antidote; you may be sure it was harmless medicine.

Salmon River Charlie was a great chief, and about to die. In the early hours of the morning I was sent for to attend him; the sick man lay gasping on a pallet, and it was plain that consumption was wasting his life; I applied the stethoscope to further ascertain. Immediately a terriffic din prevented me from hearing. Going to the side of the hut I found two men at carpenter work on a box, chiefly driving nails. As it was assuming the shape of a coffin, I became somewhat interested and was told that it was for the chief inside, who would shortly need it. Whether the plain forecast of his approaching end affected the chief, I could not see. It could not have been cheerful to say the least, and did not imply much faith in medical aid.

During the large congregation of Indians a year later, two babies were brought to me with what appeared to be ulcers on the arm. I could not account for these at the time, but later was told they had been bitten by the "wild man." It appears that this wild man is one of the characters of the Potlatch. He goes into the woods naked for about a week, and finally arrives in the village in a wild state; part of the game being to bite any individual he sees. These two babies had been so honoured, and I am assured that it is a mark of distinction.

The custom of mourning for the dead was in full flower at this time, a day was appointed for the funeral, orations were given extolling the virtues of the dead man, his immediate relatives expressed grief by wailing and scratching their faces with their finger nails, even to permanent disfigurement, and the affair wound up by the presentation of money and various articles from a relative of the deceased, who was master of ceremonies for the day. It always fell to my lot later to administer to the wounds on the face, which were often difficult to heal, and entailed frequent dressings and care.

Fig. 1

In 1918, at the time of the influenza epidemic, I had just recovered from an attack when I received a call to attend the Homalco Indian at Church House, a man and boat having been sent to take me over. Owing to the state of my own health and a violent storm, I hesitated to go, but the man was very insistent, telling me the Indian was very sick and in great pain. Finally, I determined to take a chance with the sea and started out. It was a memorable trip and I believe that only an Indian could have navigated around the wind-swept and wave-lashed cape. At length, not without considerable danger and much sea-sickness, we reached our destination. I found an old Indian, the largest I have ever seen, lying dead; he was three hundred pounds in weight. The most disconcerting news to me, however, was to learn that he had been dead some considerable time before I had been sent for. It appeared that during an altercation the night before between this man's son and another Indian, probably due to drink, the huge man had intervened and the excitement had brought on apoplexy from which he died. It was the first time I had risked my life to bring medical succour to a dead Indian, and I must confess that after what I had gone through it took me some time to see the incongruity of the situation.

Fig. 2

The advent of pituitary extract was a notable discovery for the Indian, and he was greatly impressed with its virtues. On my first call to an obstetric case I had used it with such wonderful effect that leaving my patient for a few minutes to look in on another case, I came back to find the baby born. I had yet to learn that doctors did not attend during actual birth, for on my next case, after giving a hypodermic, and, intending to stay, I sat down to wait. I was shortly asked if I was about ready for the boat; I at once took the hint and departed, consequently the chief medical operation in the Indian obstetrical case consists in giving pituitary and making a gentle exit before the drug takes effect.

One of the reasons for the destruction of Indian villages on the coast has been due to the Indian funeral superstitions. Formerly when an Indian died in a house, it was burnt, of course after removal of the body. Later in my time, a hole was cut in the wall, and the corpse removed through it, as they would never take a dead man out of a door, for fear of future calamity. At present, an Indian about to die is usually removed to a small shack dwelling, where he spends his last hours, thus saving houses.

Salvarsan has proved a great boon to the Indian, and in these immediate tribes has been a most important health factor. According to Mr. William Halliday, Chief Indian Agent for the district, the Kwquithlih Agency, the Wewayakium and Wewayakum tribes are the only tribes in British Columbia that show an increase in births over deaths, and this only in the last two or three years. Undoubtedly, this is due to the fact that I have used salvarsan extensively in these tribes, which has resulted in the sterilization of the disease in infected stock and prevented the contamination of healthy stock. In connection with this, I would urge the increased use of salvarsan in Indians by Indian physicians and a greater interest in this factor by the Government.

The most remarkable instance of vitality in the tribes, was that of an Indian woman, Mrs. Oscar Louie. I operated for pelvic infection and encountered a very severe pelvic abdominal peritonitis, with such an amount of plastic inflammation as to occlude ovaries, tubes and bowels; drains were inserted and, despite hopeless prognostics, the patient survived, perhaps owing to a wonderful vitality derived from a race of hardy ancestors. She is alive to-day, and has lately presented her husband with a fine boy.

A fact of considerable disturbance when I first entered on work here was interference from medicine men who chanted weird songs over the sick, removed imaginary fishbones from various parts of their bodies, pocketed evil spirits, and in other ways negatived the work of the physician and made them despise the white man's medicine. An instance of this before the advent of the physician was told me by the missionary in this division. It seems at that time the Government supplied a few drugs to the missionary to dispense to the sick Indians. One day an old Indian demanded relief from a severe pain, the missionary, bethinking himself of his stock of medicine, gave him a half dozen one-half grain morphine tablets, for immediate relief, with instructions to take one and to keep some for future occasions, if necessary. As soon as the missionary left, the Indian made the entire lot into one powder and with the remark, "Ugh! White Man's medicine, him no strong," he took them all in one dose. It is needless to say that he slept, the unfortunate part being that he never wakened.

Fish poisoning, contracted at the cannery at Quathiaska Cove, was one of the most intractable diseases. It produces an inflamed and purulent condition of the tissues, of a very virulent nature. The poison infiltrates the tissues. The treatment consists in numerous incisions and continual compresses of antiseptic solution.

In this division the old order is changing, and civilization has been very rapid this last eight years. The prayers and laments to the old god Waikie, have ceased; no longer are provisions placed on the graves to sustain the spirit on its journey to the next world. Their emblem, "The Thunder Bird," still plays about the Totem Poles, but the ancient glory is departed. Many of these changes are due to the earnest efforts of the Rev. W. Scott to Christianize the Indian, which efforts are now almost crowned with success. The exertions of the Indian Agent, Mr. W. Halliday, to terminate the Potlatch, have also played an important part. A new Indian is rising on the ashes of the old, many now have modern houses and motor cars, and are rapidly taking a useful place in the White Man's civilization.

INDUSTRIAL MEDICINE: ITS MOTIVES AND MERITS*

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THE development of the industrial system of to-day from the trade guilds of the Middle Ages has transformed the whole life of civilized nations and industrial medicine is of the utmost importance because it deals with the health, safety and human rights of the vast majority of the population.

The modern factory system, which had its beginning in Italy during the 15th and 16th centuries, is responsible for taking man out of his natural, pastoral environment and making it necessary for him to learn the use of strange tools and the operation of complicated machinery. With the passing of domestic and handicraft production came a concentration of population in manufacturing districts and it did not take long for industrial workers to realize that steam and speed had not improved their lot in life. It is, nevertheless, only in recent years that we have begun to understand and appreciate the underlying principles of the conditions affecting the health of the industrially employed.

Less than twenty years ago it was thought that there was but one fundamental factor in industry—production—but far-sighted employers have come to realize that there is another which is equally essential—and this second factor is *personnel.* In this connection, it is fitting to lay emphasis upon the fact that despite all improvements in labour saving devices, the human machine is and will ever remain the most vital and indispensable mechanism in the production of industrial wealth.

Now the problems of industrial medicine come under three general headings: (1) the prevention of occupational diseases and industrial hazards; (2) the prevention and control of communicable diseases in industry; (3) the correction of unhygienic conditions of life and work which determine or contribute to premature death. But before discussing some of the more important phases of industrial medical practice let me say that there should be nothing about it that savours of paternalism or philanthropy. Charity and business mix no more successfully than oil and water and, in my opinion, it is most unfortunate that the word "welfare"—which has long been identified with philanthropic endeavor—should ever have been applied to the efforts of industrial establishments to promote the health and safety as well as to improve the working and living conditions of their employees.

Sound industrial health work rests on six principles. First, it must be what it appears to be. It must define itself in its own terms. It cannot be substituted for the just demands of the workers. Second, it should embody the spirit of service. Third, it should be developed as the expanding consciousness of the workers calls for such service. Nothing should be thrown at or "wished on" them. Fourth, it should include preventive as well as curative measures. Fifth, it should take into consideration home and community conditions. Sixth, it should produce results that will justify the operating overhead.

Industrial medicine, in the ultimate analysis, must be advantageous to both employer and employee if it is to accomplish anything and economically sound if it is to last. Otherwise expressed, its effectiveness will depend upon the degree of cooperative effort and its permanence upon its dollars and cents value. This does not mean that intangible returns must be translated into financial equivalents but that the sum total of results must justify the operating costs.

As a substitute for security or continuity of employment, proper working conditions, reasonable hours of labour, fair wages, or any other fundamental factor of industrial relations, industrial health work suffers the fate of most attempted substitutions, but standing on its own merits it has and will continue to have a record of important achievement. The physician in industry has been defined as "one who applies the principles of modern medicine and surgery to the industrial worker, sick or well; supplementing the remedial agencies of medicine by the sound application of hygiene, sanitation, and accident prevention; and who, in addition, has an adequate and cooperative appreciation of the social, economic, and administrative problems of industry in its relation to society." Just what this means practically and what it amounts to from the standpoint of its value and importance may best be considered by taking up a few of the more outstanding aspects or subdivisions of industrial medicine.

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A complete programme embraces activities which have been divided by Mock into two groups: (1) those directly concerned with health supervision, and (2) those which are adjuncts or auxiliaries. Under the former are the medical, surgical, dental, nursing, safety and sanitation services, while in the second group are the employment, restaurant, recreation, insurance, pension, loan, housing and community services.

Since there is much in industrial medical practice that is only of casual interest to the private practitioner, it has seemed desirable to limit the subject matter to those fundamentals which are of importance to both physicians in industry and their colleagues in general practice.

Let us begin with accident prevention, which is a function of the "safety service."

As Juhnke expressed it, "The end is that the workman shall live to enjoy the fruits of his labour; that his mother shall have the comfort of his arm in her age; that his wife shall not be untimely a widow; that his children shall have a father; and that cripples and helpless wrecks who were once strong men, shall no longer be a by-product of industry."

The different aspects of safety work relate to: (1) Organization, (2) Education, and (3) Safeguarding. Young, of the National Safety Council of the United States, has estimated the value of each as follows: Organization, 45%; Education, 30%; Safeguarding, 25%. Every means to engender a spirit of prevention should be employed and, not only should every effort be made to prevent accidents, but also, the restoration of an injured employee should be considered as being both a moral and an economic responsibility. The existing Workmen's Compensation legislation which merely provides for the payment of one-half of an employee's wages beginning on the eighth day after a disabling injury, falls very far short of the needs of the situation. Doctors' fees, hospital expenses and the services of a specialist, when necessary, should be provided at the expense of industrial establishments. The economy of liberality in this respect has been demonstrated by at least one Canadian company which has found that the reduction in the period of disability and the decrease in permanent impairments have more than justified the additional expenditures. Furthermore, the 1922 figures of this same concern showed that the lost time on account of accidents was 44% less than the average prior to the inauguration of modern safety measures. In other words, the maintenance of the "safety service" reduced by 44% the expenditures of the company for hospital bills, doctors' fees and compensation awards and at the same time saved the employees a similar percentage in the amount of wages lost on account of accidents.

First-aid departments are among the best investments that industrial establishments can make because of their value in preventing infections and other serious complications that may result from injuries. It should be emphasized, however, that a limited number of standardized methods employed by trained *personnel* under medical supervision are among the fundamental requirements.

In passing on to the consideration of industrial medical services, one finds that in addition to those matters directly related to medicine and surgery, they are ordinarily concerned with a variety of interests, among which may be mentioned: physical examinations, personal hygiene, plant sanitation and occupational research. In connection with the physical examinations, it should be thoroughly appreciated that they are not a scheme either for weeding out employees who are beginning to wear out or for depriving handicapped applicants of a chance to get a job. As a matter of fact, the only reasons for rejecting an applicant for employment should be three: (1) when it would be a source of danger to himself, (2) to his fellow workers, or (3) to property. Life insurance companies have reported that periodic physical examinations have a potential life saving value of $30.00 each. Industrial workers cannot be properly and efficiently placed unless something is known about their physical condition and through such examinations threatened disease is discovered while it is still preventable or at least curable, conditions are detected which make the employee prone to accidents or to cause accidents to others, the working force is protected from communicable diseases, mental deficiencies and physical handicaps constituting a health hazard are brought to light, both temporary and permanent incapacity is reduced, the amount of wages lost on account of illness is cut down, and the cost to the employees of their health insurance is greatly diminished.

The need of physical examinations is well illustrated by a recent study of the Laurentide Health Service records of all applicants and employees between the ages of 16 and 20. The analysis of this group showed:

Number classified as (1), or physically fit for any employment—1 or 1.3%.

Number classified as (2), or physically fit for any employment, but substandard in some respect—51 or 63.7%.

Number classified as (3), or physically fit for specified employment only—15 or 18.7%.

Number classified as (4), or physically unfit for any employment—13, or 16.3%.

There were 9 with tuberculosis, 3 with heart disease, 6 with defective vision, 6 with defective hearing, 2 with hernia, 36 with badly diseased teeth and 36 with grossly enlarged tonsils and adenoids. The majority had more than one form of physical defect. Some one has said that there are lies, damned lies, and statistics; furthermore, our figures are for a very small group; but if, by any chance, they represent the conditions among young industrial workers generally, they reflect a sad state of affairs.

From the standpoint of personal hygiene, the needs of each employee are discovered by the examining physician and the necessary instruction is given to meet the individual requirements. Now, the success of industrial health work will be proportionate to the extent of the development by the workers of a higher sense of responsibility for the care of their bodies and those employees who are most receptive to the hygienic principles of life and work are rewarded for their efforts by enjoying the highest reaches of working power and all that it implies from the standpoint of financial returns and advantages.

The problems concerned with plant sanitation are among the most fundamental with which industrial medical services have to deal and it is the duty of every physician in industry to improve the sanitation conditions in his plant to the end that the workers will have the greatest possible protection, the company will receive the greatest possible benefits from the improved conditions and the sanitary standards of the plant will serve as a model for others. Such an effort would constitute the greatest public health movement ever inaugurated in the country and the men responsible for it would take their places in the foremost ranks of the medical profession. The specific problems of plant sanitation in any given instance will depend upon the nature of the industry and the physical conditions of the plant and its surroundings. It is obviously not intended that the sanitary engineer shall be supplanted; but it is expected that every physician in industry will have some knowledge of the essential principles of sanitation and that there will be the closest co-operation between industrial physicians, sanitary engineers and operating managers in making and keeping shops and factories sanitary and healthful.

In connection with occupational research, industrial medical services may render great assistance to employment departments by studying the factors concerned with the mentality of the worker, his physical status, the conditions of work and the working place, the materials, processes, etc., so that employees may be placed in positions which will not be prejudicial to their health. Experience has shown that too few medical men are acquainted with industrial processes and that relatively few employment managers have any conception of the medical problems concerned with industrial occupations. Except in rare instances, but little attention is paid to the kind of work to which employees are mentally and physically adapted although, from every point of view, there is nothing more unfortunate for any worker than incompatibility with his job.

The returns from industrial medical services to both employer and employee are of the greatest value and importance. The character of the services rendered makes the assignment of financial equivalents a relatively simple matter and the 1922 report of one Canadian plant showed a financial return of $23,361.62 on a medical service expenditure of $7,436.50.

Time will not permit of a discussion of dental insurance and other subdivisions of industrial health services. There are, however, three important facts that I want to leave with you. The first is that in addition to the economic soundness of industrial medicine as demonstrated by the financial returns, there are still more important intangible results which cannot be translated into terms of dollars and cents but find expression in greater loyalty, greater contentment, greater co-operation, greater production;

and less absenteeism, less labour turnover and less operating expense. The second is that from the standpoint of those in general practice, physicians in industry are collaborators rather than competitors. They do not deal with conditions of non-industrial origin and they advance both the professional and financial interests of their colleagues who are engaged in private work. The third thought that I want to emphasize is that industrial medicine is concerned not only with medical but also with social and economic problems, and that these matters are of vital importance to the very existence of our present social order.

THE TREATMENT OF BLADDER TUMOURS*

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HISTOLOGICALLY, bladder tumours are classified as innocent and malignant, clinically they are all malignant, every gradation being found from the so-called benign papilloma, through the stalked papillary carcinoma and the cauliflower tumour to the flat sessile carcinoma involving the whole thickness of the bladder wall and invading the cellular tissue beyond it.

For the successful treatment of any type of bladder an early diagnosis, appropriate treatment, and regular follow up examinations are essential.

The benign papilloma consists of a slender stalk bearing fine discrete villi which do not adhere at their edges, the muscular layer of the bladder wall is not involved and metastatic growths do not occur. The tumour, as a rule single at first, multiplies by seed implantation in the bladder until the viscus is filled with tumours of varying age and size, sooner or later the villi thicken and adhere at points of contact, the cells undergo mitotic division, lose their regular arrangement, the growth becomes a carcinoma, and infiltration of the bladder wall occurs. It must not be inferred that all papillary carcinomata start as benign tumours, the growth may be malignant from the first but the etiology is certainly similar for a papillary carcinoma may recur as small groups of benign tumours and a benign papilloma may recur in the malignant form.

The prominent symptom of these growths is haematuria, small in amount in the early stages amounting often to no more than a few drops squeezed out at the end of micturition, it will clear entirely for longer or shorter periods giving false hopes of cure while the growth advances beyond nonoperative control; hence the importance of immediate cystoscopy in every case of haematuria of unknown origin.

The sessile tumours are infiltrating carcinomata, the surface of the tumour may be covered with short villi giving the familiar cauliflower appearance or it may be smooth, or ulcerated and necrosed. These growths are usually single and remain so, they involve the whole thickness of the bladder wall and quickly invade the peritoneum and the cellular tissue of the pelvis, later secondary growths appear in the pelvic bones, lungs, and other organs.

The early symptoms before ulceration occurs are those of a mild chronic cystitis, more severe if the growth is near the trigone, quite slight if the growth is at the fundus; periods of haematuria now occur and become more frequent and severe, sometimes culminating in clot retention. Necrosis and infection produce a violent cystitis and pave the way to death from ascending infection.

The following procedures are in vogue for different types and stages of bladder tumours: (1) Fulguration through the cystoscope. (2) Suprapubic cystotomy and fulguration through the open bladder. (3) Suprapubic cystotomy and excision of the growth with the submucosa. (4) Partial cystectomy. (5) Radium and deep X-ray therapy. (6) Permanent cystotomy.

Fulguration is not cauterization, it is heat coagulation of the deeper cells which form the root of the tumour in the bladder wall by means of a current of very high voltage, low amperage and very rapid alternation; the blood supply of the tumour or of a portion of it being thus cut off, aseptic necrosis occurs and when the slough has separated, which happens after about ten days, normal regeneration takes place. From two to six treatments are required.

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The current is obtained from any one of a variety of machines designed for the purpose; one electrode is large and placed under the back of the patient or the wire may be connected with the metal knee crutch, the other electrode is small and applied to the tumour; the maximum heat is produced about one centimetre from the small electrode, that is in the root of the tumour, if contact between the electrode and the growth be broken sparking and superficial cauterization will occur, this is not adequate for our purpose.

Fulguration through the cystoscope is the method of choice in all tumours with a definite pedicle where the tumour is not more than an inch or so in diameter and the seed tumours are not so numerous as to preclude the destruction of them all in a reasonable number of treatments. The extent of tumour formation which can be dealt with cystoscopically depends on the skill of the operator; in extensive cases it is well to give a general anaesthetic for the first treatment, the small ones can then be entirely destroyed and the larger ones got under control at one sitting. Snaring or cutting off papillomata through the cystoscope is bad practice as it leads to implantation tumours.

Experience will show that certain pedunculated carcinomata with thick villi cannot be controlled cystoscopically, these cases and those bladders with extensive benign papillomatosis must be treated through the open bladder. The large indifferent electrode covered with a pad wet with saline is placed under the patient's shoulders taking care that good contact is made so that sparking, which would result in a burn, is avoided. Under gas oxygen anaesthesia the patient is placed in the Trendelenburg position and a median incision made from the symphysis pubis towards the umbilicus, the peritoneum is stripped up from the front of the bladder and the bladder opened widely and a self-retaining retractor inserted; the growth is wrapped in gauze (if large enough) and pulled upon to stretch the pedicle, two small electrodes are then held at opposite points at the base of the pedicle and the growth burnt off, one of the electrodes is now discarded and its wire connected with the large electrode under the patient's shoulders and the base of the tumour is treated, lastly any implantation tumours present are destroyed. No ligatures are necessary even for large tumours, the advantage of this when the tumour is over the intramural portion of the ureter is obvious. The bladder is closed with a Connell stitch, a 28 F. De Pezzer tube being inserted at the upper end of the incision, a small rubber drain is placed in the space of Retzius and the wound closed. The lowest stitch through the rectus sheath should include the bladder wall at the upper end of the bladder incision, a dead space and leakage of urine into the upper part of the wound is in this way avoided. The drain is removed in twenty-four to thirty-six hours and on the fifth day the De Pezzer tube is removed and an 18 F. button catheter inserted in its place, this is discarded about the eighth day and, if no urine is passed per urethram in forty-eight hours, a catheter is tied in until the wound has healed. Beginning on the second day after operation, the bladder is irrigated daily with 1/8000 silver nitrate solution, no force must be used, the barrel of a glass syringe is inserted into the De Pezzer tube, a small quantity of the solution poured in from a jug and allowed to run out and the process repeated.

Suprapubic cystotomy and excision of the growth with the submucosa is applicable to papillomata too large for cystoscopic treatment. Great care is necessary in handling the growth to avoid soiling the bladder walls and producing implantation tumours. The usual site for recurrences after this operation is the suprapubic scar. On the whole the open fulguration method is preferable.

Partial resection of the bladder is the method of choice in dealing with a sessile or infiltrating carcinoma and is the only treatment at present available which is likely to give a good result. Unfortunately, many cases come too late for operation especially those where the growth (as is usually the case) is situated at the base of the bladder. The extent of bladder wall infiltrated by the growth is not so important in determining the operability as is the presence of infiltration in the pelvic cellular tissue as determined by rectal or vaginal examination, and the presence of secondary growths in bone or other organs.

The technique of operation is briefly as follows: Under gas oxygen anaesthesia the patient is placed in the Trendelenburg position and a median incision made from symphysis pubis to within an inch or so of the umbilicus, the recti are retracted and the hand passed down into the lateral vesical space on the side corresponding with the site of the tumour. The peritoneum is separated from the bladder to within three-quarters of an inch of the situation of the tumour which can be felt at this stage through the bladder wall. Working around on each side of the tumour the peritoneum is separated from the bladder as far as can be reached, the peritoneum is incised transversely and by continuing the incision a portion of peritoneum is excised and left attached to the bladder. The peritoneal cavity is now closed and we have the bladder isolated extraperitonealy. If the growth is so near the ureter that there is danger of dividing it in the excision, it should be identified at this stage. The bladder is now opened half an inch from the tumour and the incision continued around the tumour thus removing the portion of bladder wall carrying the growth with a frill of normal bladder wall surrounding it, if the ureter is cut it is sewn into the incision as the bladder is closed, a De Pezzer catheter is inserted into the upper end of the bladder incision and a rubber drainage tube placed extravesically to take care of any leakage and the wound closed. The reconstructive power of the bladder is remarkable; a cavity holding a drachm or so at the end of the operation will in six weeks have expanded to an approximate normal capacity.

The results of radium treatment do not justify its use as an alternative to partial cystectomy where the latter is possible. Radium is of use as a palliative measure in inoperable cases and for treating recurrent carcinomata; it may be used in needles imbedded in the tumour or in a tube resting on the surface of the tumour and packed in position with gauze which also serves to separate the healthy bladder from the tube. The insertion is done through a suprapubic incision. After ten to fifteen hours the radium and packing are removed and a button catheter inserted. Small recurrences may be treated by inserting radium needles or emanation points through the cystoscope.

It may be advisable to precede the introduction of radium by a deep X-ray treatment given the day before operation, in which case healing of the wound will be delayed.

Very advanced cases with extensive infiltration of the pelvis are best treated with morphia, a permanent cystotomy being done if the pain and frequency is great or if there is urethral obstruction. Radium or X-rays in these cases will merely increase the torture by increasing the sloughing and cystitis, the expression one often hears, "it can't do any harm and may do some good" is far from the truth.

As a summary one may say that if satisfactory results are to be obtained immediate cystoscopy is essential in every case of haematuria of unknown origin. Fulguration through the cystoscope is the method of choice for small papillomata, fulguration through the open bladder for large ones. Partial cystectomy is necessary for sessile carcinomata. Radium and X-rays should be reserved for inoperable cases and recurrent carcinomata. Some cases are too far advanced for even this treatment. Patients must be re-examined two months after operation and if free of growth, six months later and again after a further six months.

A Study of Thirty-Four Cases of Abscess of the Lung.—A study was made by J. J. Singer and Evarts A. Graham, St. Louis, of thirty-four cases of lung abscess. Eight cases followed tonsillectomy. Of thirteen patients submitting to operation, six died, a mortality of 46 per cent. A third patient operated on died several months later with extensive carcinomatous metastes. The authors state that abscess of the lungs is being recognized more to-day than heretofore. The large number of tonsillectomies done is one factor which is responsible for what is apparently a greater number of abscesses than formerly. Early recognition and operation before the abscess has become chronic frequently prevents the failure of treatment, although many patients will recover with non-surgical treatment. Careful history taking, physical signs, use of the roentgen ray and diagnostic pneumothorax make early recognition possible. Patients who do not recover in two or three months need surgical treatment. —*Jour. A. M. A.*, July 21, 1923.

REPORT OF THE EPIDEMIC OF TYPHOID FEVER AT MANSONVILLE, QUEBEC

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Mansonville, P.Q.

A REPORT of the recent epidemic of typhoid which occurred at Mansonville, will probably be of interest to the medical profession. For that reason as well as for any lesson which may be gained from our experience here I am writing this report.

The cause of the epidemic was a contaminated water supply without doubt, although it must be acknowledged that repeated tests of the water failed to discover any typhoid bacilli.

On February 27th, I was called in to see a young man, a railroad employee who lived about two miles from the village, he was suffering from an intense frontal headache, fever and malaise. After making a complete physical examination I discovered in his urine a large amount of albumen, numerous casts, and a few red blood cells. I consequently made a diagnosis of acute nephritis and treated the case accordingly. The nephritis improved almost immediately but the condition of the patient grew worse, and it was the eighth day of disease when I made the correct diagnosis of typhoid fever and ordered the proper precautions to be taken for the isolation of the patient. The patient made a rapid recovery and it was only after the outbreak of typhoid fever in the village that we discovered that the drainage from this farm house finds its way indirectly into a small stream which forms part of the water supply to the village reservoir about one mile below.

On March 21st the first patient of the general outbreak came to my office for consultation. However, I was unable to do anything that day as I had been suffering for three days already with hiccough, and was taken to the Royal Victoria Hospital, Montreal, the following day, when a diagnosis of encephalitis was made and it was only on March 27th when I was able to resume work.

In the meantime, Dr. A. C. Paintin, of Knowlton, had been called in consultation by several families and had expressed a suspicion that typhoid fever was the cause of the outbreak.

The epidemic by this time was general throughout the village with scattered cases, mostly school children, in the country. With the assistance of two district nurses, as well as many private nurses, and Mr. M. R. Stalker, medical student at McGill University, I attempted to treat the people in their homes. It soon became apparent that this was impossible as whole families were prostrated and were suffering from lack of care so we organized an emergency hospital in the schoolhouse on April 17th. There we treated thirty-six patients (taken from poorer families who were unable to pay for private nurses). Two of our hospital patients died. It was just at the time Mr. Stalker had an attack of acute appendicitis and was removed to the Montreal General Hospital for operation. I then secured the assistance of Dr. A. C. Paintin, of Knowlton. Here let me express a word of appreciation to Dr. Paintin for his unfailing cooperation, courtesy and support in every emergency. It was indeed a pleasure to work with a man of such sound judgment and wide clinical experience. The worst of the epidemic soon passed over, Dr. Paintin returned to his home on May 19th, and we closed the hospital on May 27th. At present writing there are only two cases in bed and these are convalescent.

Type of Disease

It was an extremely malignant type of infection, a great many cases coming down acutely with high temperature, intense headache, backache, and pronounced nervous symptoms. Relapses and haemorrhages were frequent and toxic delirious cases very common. The majority of deaths were due to exhaustion from a deeply toxic condition, the heart becoming rapid, irregular and gradually weaker. No case of sudden heart failure was observed.

Death Rate

There were 205 cases in all with sixteen deaths, making a death rate of 7.8 per cent. One death was due to perforation; three to haemorrhage and the others to exhaustion with the various complications of pneumonia, haemorrhage, and parotitis; five of the deaths reported occurred in various places outside Mansonville.

Sex.—Eighty-eight cases were male; 107 cases were female.

Age of Patients.—1st decade, 45 cases; 2nd decade, 67 cases; 3rd decade, 26 cases; 4th decade, 26 cases; 5th decade, 28 cases; 6th decade, 8 cases; 7th decade, 5 cases.

Complications

Bronchitis was very common, so common in fact as to be almost a symptom of the disease. No definite figures are available. *Haemorrhage*; twenty cases, *i.e.*, 9.7 per cent. The percentage is actually higher, because I know there were cases which escaped observatoin in private houses or were not recorded. Eight of these cases ended fatally; three only being directly due to haemorrhage, the others dying from a complicatting pneumonia or from exhaustion, etc. On the whole, it has been my observation that a haemorrhage of the bowel is, in a majority of cases, beneficial to the patient and that a marked improvement usually begins at this time. It has occurred to me that the blood lying in the lumen of the bowel acts as a foreign protein, is absorbed as such, probably through the ulcerated areas, and creates an active immunity against protein in general, of which the typhoid protein is one. Would it not be worthy of trial for some investigator to try the effect of injecting a foreign protein by rectum into the large bowel as a form of treatment? *Perforation*; there was one case. The perforation occurred during a relapse and did not follow a haemorrhage. The patient died. *Parotitis*; two cases, both fatal. *Submaxillary Adenitis*; one case, recovering. *Cholecystitis*; three cases; two during the course of the disease, one during convalescence; all recovered without operation. *Otitis Media*; one case. *Pneumonia*; six cases; four of these were fatal with additional complications of haemorrhage or parotitis and great toxaemia. *Haemoptysis*; one case; the patient, a little girl of thirteen years, coughed up about one cupful of blood, recovery. *Retention of Urine* was fairly common; four cases had to be catheterized for about one week. *Hyperpyrexia*; two cases; one case had a temperature of 107° and died two weeks later in the Royal Victoria Hospital following an attack of pneumonia; the other case had a temperature of 106.4° and recovered. *Acute Nephritis*; two cases; one fatal, which was complicated by a relapse and three haemorrhages, also died in the Royal Victoria Hospital. *Mastitis*; three cases. *Abortion*; five cases; every case of pregnancy terminated in abortion. *Convulsions*; one case. This was an extremely interesting case with marked nervous symptoms; symptoms of meningeal irritation, when she would scream at the top of her voice and finally go into convulsions. Her temperature rose to 106.4° on one occasion. The patient recovered. *Neuritis and Painful Muscles*; was a frequent complication of convalescence. *Arthritis*; one case affecting the ankle joints. *Abscesses* were very common, one patient having twenty abscesses; four cases had ischio-rectal abscesses. *Phlebitis*; one case. *Post Typhoid Insanity*; two cases, both recovering. *Recrudescences and Relapses*; eighteen cases (8.7%) two were fatal. There were several cases where the patient had a prodromal attack of fever lasting three to five days with all the symptoms of a beginning attack of typhoid fever. This is a phenomenon I have not seen recorded. I have one beautiful chart of such a case. *Previous History of Typhoid Fever*; one case.

Symptoms.—The symptoms of typhoid fever are so well known that I can add nothing. However, I could not help but be impressed with the universal complaint of headache. Sometimes frontal, sometimes occipital, and sometimes in the vertex, but always intense and persisting. An insidious onset usually so characteristic was marked by its absence.

Treatment.—Prophylaxis, of course, is the best treatment. I owe my own escape to having been inoculated one year ago. There are several returned men in town who were inoculated in the army four or five years ago. Of these only one came down and he had a very mild easy course. During the early part of the epidemic I used for inoculation purposes ordinary typhoid vaccine. Amongst the patients inoculated, ten came down before the inoculation was completed and eight subsequent to the third inoculation; the presumption being that they were in their incubation period while being immunized. Of these patients only one died, the others running comparatively mild courses. Later in the course of the epidemic I began to use typho-serobacterin (mixed typhoid and paratyphoid A and B.) both for immunization and treatment. This is a suspension of bacteria combined with specific immune serum. By this process the manufacturers claim to do away with the clinical negative phase of ordinary vaccine and to give immediate protection. This appears to be borne out by my experience for of all the cases I inoculated with the vaccine, and they were many, only one came down subsequent to the first inoculation.

I treated thirty-two patients by giving subcutaneous injections of the same vaccine 1,000 million every three days. Fourteen of these patients were treated from the beginning of their illness. All had mild or moderate courses with no complication whatever and no deaths. The eighteen other patients began their treatment late in the course of the disease, five subsequent to relapse. Complications in this series were frequent but all of them recovered. These were not picked cases, but when I was convinced of the value of the treatment I treated every patient with vaccine. Previous experiences with ordinary vaccine gave no results whatever to my observation.

Early in the course of the epidemic I treated fourteen patients by intravenous injection of twenty-five million typhoid bacteria. In only three cases was there any marked improvement. These three cases, however, showed a phenomenal improvement. They were all three early cases with a very high temperature, severe bronchitis and great toxaemia. Subsequent to one injection each, the aspect of the patients completely altered and they ran mild uneventful courses to recovery. In the other cases treated by the intravenous method I could see no results whatever. In only two cases did a chill follow the injection. It is my opinion that better results can be obtained with larger doses and it was only fear of disastrous results that kept me from employing them.

Another method of treatment I employed with marked success was the intramuscular injection of boiled milk, 5 cc. in children and 10 cc. in adults every three days. This treatment to be of any value must be given early in the course of the disease. Eleven cases so treated ran very mild easy courses, four of them clearing up within seven days. There were only two cases in the series complicated with superficial abscesses. There were no other complications. Children gave a much more favourable reaction than adults to milk injections. Milk given later in the course of the disease had no effect whatever. Amongst ten cases given milk injections late in the disease, all very grave, four ended in death. None of these patients had any haemorrhage subsequent to the injection of milk. In fact I used milk freely as a haemostatic serum.

We used drugs purely as the occasion demanded, stimulants as they were required and morphia when indicated. A hypodermic of morphia given to a restless delirious patient will give him a long quiet sleep from which he usually wakens much refreshed and in a clearer mental condition than before. Paraldehyde by rectum on occasions gave equally good results.

There is one drug we used with much success. That is pyramidon (Hoechst). If pyramidon is given to a typhoid patient in the *status typhosus* with a high temperature, thick, swollen, heavily coated, brown tongue, and bleeding lips, it is truly remarkable to note the improvement in condition. The temperature falls almost immediately, the pulse also becomes less rapid, the mouth becomes moist, the tongue clean and the mental condition improves. This has been my observation in every case so treated. Dr. Paintin observed in one of his cases that he had to stop the treatment owing to the deleterious effect on the pulse. In other patients, who were running a prolonged course of fever when they should normally have been convalescent, a few doses of pyramidon brought the temperature to normal where it remained after the withdrawal of the drug. Pyramidon is closely related to antipyrin from which it differs by the addition of the dimethylamido group.

After all our treatment is exhausted, however, we fall back upon nursing as the one treatment, *par excellence*, for typhoid fever. The patients which we had transferred to the hospital, away from the influence of their anxious friends, where they were regularly fed, watered, sponged and given enemas, immediately began to improve. Treatment in the home even with two private nurses in attendance was much less satisfactory, and it was here in the private homes with private nurses where the mortality was heaviest. The poor people, removed to the public hospital, escaped lightly.

Case Reports

CASE OF STREPTOCOCCUS VIRIDANS BACTERIAEMIA WITH ENDOCARDITIS AND APPARENT RECOVERY*

Harris McPhedran, M.B.

Toronto

H. L., age 45, admitted to St. Michael's Hospital January 7th, 1922, following injury to left arm while working for the Toronto Transportation Commission.

Previous illnesses, none.

Examination showed fracture of left olecranon process, which was treated in the usual way. On January 10th, 1922, it was noted by the attending surgeon, Dr. Malcolm Cameron, that the patient was rather pale and was running an evening temperature of 99° to 100° F. Blood examination showed as follows: red blood corpuscles, 3,400,000; white blood corpuscles, 7,200; haemoglobin, 60%; urine normal; heart, lungs and abdomen seemed normal. I saw him again on January 20th, 1922, and reported as follows: teeth and gums diseased; tonsils normal; heart apex in 5th space mid-clavicular line, rate normal, rhythm regular, blowing systolic murmur; lungs clear; spleen not palpated; fever evening rise to 99° to 100° F.

In view of (1) continuous low grade fever, (2) secondary anaemia, and (3) mitral murmur, I advised blood culture for streptococcus viridans. During examination patient declared that apart from arm he was not now, and never had been, ill and at the time of accident he was swinging all day a ten pound hammer on construction work. On January 25th, 1922, he left the hospital against advice, still vowing he was not ill, but promised to return for report of blood culture.

February 3rd, 1922; blood examination showed red blood count 3,200,000, white blood count 8,500, differential, polys. 70%, lymphs. 23%; blood culture positive for streptococcus viridans.

February 17th, 1922; streptococcus viridans again found in the blood and patient urged to return to the hospital.

March 1st, 1922; patient readmitted, still feels well. Heart one inch outside mid-clavicular line, mitral murmur still present, no evidence of aortic regurgitation, spleen not palpated, blood not examined.

March 13th, 1922; no fever since admission, transfused 1,100 cc. blood by direct method; patient had very little reaction following this.

March 16th, 1922; red blood count 4,000,000 haemo globin, 42%; white blood count 6,000.

March 28th, 1922; blood culture sterile.

April 6th, 1922; general condition good, no fever for three weeks; appetite good, R.B.C. 4,400,000; haemoglobin 65%; blood culture sterile; heart apex at mid-clavicular line, mitral murmur still present, no aortic diastolic; spleen not palpated. Diseased teeth were extracted. Patient stayed in hospital till June 7th, 1922. Blood culture remained sterile and heart became normal in size; blood count normal but haemoglobin 65%. Patient stated he never felt better in his life. Diagnosis, streptococcus viridans bacteriaemia with apparently mitral endocarditis.

Progress.—January 3rd, 1923, red blood count 4,400000, white blood count 5,600, haemoglobin 67%. Patient at this time doing heavy work with the Transportation Commission and had been doing so for several months past and feeling well.

February 23rd; again examined; blood culture sterile; liver enlarged.

Horder[1] gives four cardinal signs of subacute bacterial endocarditis; (*a*) multiple arterial embolism, (*b*) endocarditis, (*c*) isolation of bacteria from blood stream and (*d*) fever. Of these the patient had the last three with a well marked secondary anaemia but no enlargement of the spleen, and no embolism noted at any time. Libman[2] has seen four cases in his series up to 1920 recover.

One thing that impressed me was the sense of well-being in one whom ordinarily one considers suffering from a fatal illness. His accident may have saved his life, in that he was forced to go to bed and remain there. Otherwise, the disease must surely have progressed more or less rapidly as patient felt in nowise ill at the time of the accident, and did very heavy manual work, and that in face of a red blood count of 3,200,000 and haemoglobin 60% without any shortness of breath or weakness, symptoms which under the circumstances one would have thought inevitable.

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*Read before Section of Medicine, Academy of Medicine, Toronto, February 13th, 1923.

Transfusion, I think, may, to some small extent have altered the course of the disease. He was afebrile at the time it was done and for some time before; it did improve his blood picture and may have been a factor in a more rapid restoration to health.

The future alone can tell whether a permanent cure has been effected but while in the hospital from time of second admission on March 7th, 1922, up till June 7th, 1922, the blood remained sterile. Since leaving the hospital he has worked hard and still feels well.

References

(1) Horder, *Brit. Med. J.*, April 28th, 1920. (2) Libman, *Idem.*

Efficacy of Antivariolar Vaccination in the Phillippines During 1921 and 1922.—In Manila, where there had been performed every year higher proportions of successful vaccinations, smallpox completely disappeared in 1921 and 1922; the last five cases, with three deaths, occurred in 1920. In the provinces and in Mindanao and Sulu, the disease could be controlled to its possible minimum, there being morbidity and mortality rates, per 10,000 population, of 1.58 and 0.73 respectively, in 1921. Regino G. Padua, Manila, P. I., says it is noteworthy that, in places where the percentage of immunized population was the highest, the morbidity and mortality rates have been the lowest, and conversely—in other words, in Mindanao and Sulu, where there have been more numerous obstacles to successful vaccination; hence, the estimated percentage of immunity being only 14.78 per cent., the morbidity and mortality rates had been during the year relatively more exuberant: 18.76 and 9.57 respectively. The returns of 1922, from five provinces under the Division of Provincial Sanitation, show 126 cases with twelve deaths from smallpox and, from one province under the Division of Mindanao and Sulu, fourteen cases with seven deaths. The morbidity and mortality rates per 10,000 population for the former were approximately 0.13 and 0.01, and for the latter 0.12 and 0.05, respectively. For comparison, such rates in 1920 were 0.17 and 0.10 for Manila, 11.85 and 4.97 for the provinces, and 89.48 and 46.45 for Mindanao and Sulu. Obviously the disease is gradually disappearing. The vaccination process, systematically conducted every year in all parts of the archipelago, has been the potent factor in this rapid reduction. As a result, 17.31 per cent of the total population had been immunized in 1921, against 15.87 per cent. in the yearly average of ten years ending 1920. Interpreting the statistical results, Padua believes that protection of the public is afforded by systematic and successful antivariolar vaccination. There are no other factors to which the eradication of smallpox in Manila and the rapid reduction of the morbidity and mortality rates in the provinces during 1921 and 1922 may be chiefly ascribed. —*Jour. A. M. A.*, May 12, 1923.

The Patient's Mind.—William House, Portland, Ore., summarizes his paper as follows: The sick body is always accompanied by a sick mind. Many sick persons have no organic disorder, but suffer from the effects of suggestion either from within or from without. If suggestion produces disease, it can also cure disease. Recovery of both mind and body is retarded by fear, worry and misinterpretation of symptoms, and is hastened by their removal. Much of the success of the cultists is due to their ability to inspire hope. All that they can do can be better done by trained physicians. There is nothing mysterious is scientific psychotherapy. Every physician consciously or unconsciously uses it in his practice. It consists in finding out what is going on in the patient's mind and relieving it by rational explanation and encouragement based on accurate diagnosis. Psychotherapy should supplement and not displace other recognized forms of treatment. Scientific minds will respond to scientific methods, but child minds can be reached only by methods suited to their limitations. —*Journal A. M. A.*, July 21, 1923.

Retrospect

SOME ASPECTS OF EXPERIMENTAL PNEUMONIA*

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It is not the intention to discuss in this review all the varied aspects of experimental pneumonia; the subject is too vast and brings with it many fundamental problems of immunity. Occasional references, however, will have to be made to such questions as the relative susceptibility of different classes of animals to pneumonia and the dosage and virulence of different strains of microorganisms. Immunology attempts to answer questions about the "seed" and "soil." You may remember Charles Kingsley's book, *Madame How and Lady Why*; problems of immunity are for "Lady Why" to solve; we are concerned with the minor question, "How does pneumonia develop?"

The earliest experimental work, to which numerous references are given in the *Catalogue of the Surgeon General's Library*, deals with the production of pneumonia after the lung has been disabled or put out of action by section of the vagus nerve, no organisms being injected to excite a response. The "soil" was merely prepared for "seeding" with organisms already present in the respiratory tract, and it is possible that we have, in traumatic pneumonia, an analogy in man. I have seen at least two cases without fracture of the rib, one in a soldier during the European war, who was struck on the back by clods of flying earth, and the other in a meat porter of Smithfield Market, whose back was severely injured by a falling carcase. Against this idea of a rapid onset of pneumonia after trauma, Meltzer and Wollstein showed, in 1919, that they were unable to produce pneumonia in animals after section of one vagus, unless they waited for ten days before injecting a dose of virulent pneumococci into the trachea. They suggested that the delay was necessary because the vasodilators do not degenerate until ten days after section of the vagus, although the vasoconstrictors degenerate after the lapse of four days.

It has for long been much debated point whether lobar pneumonia is haematogenous or bronchiogenic. In support of the former view it has been put forward that the consolidation involves a whole lobe quite impartially and that the pneumococcus may be grown from the general circulation in the course of the disease. The former argument does not carry much weight with it, for Kline and Meltzer showed, in 1915, that hepatization of the lungs—to the naked eye identical with lobar pneumonia—could be produced by blowing down into the trachea of a dog suspensions of such substances as aleuronate (a flour consisting largely of vegetable albumin), starch, egg-yolk, and lecithin. Under the microscope the exudate in the air sacs was seen to consist of red and white blood cells and a good deal of fibrin. The argument from positive blood cultures loses some of its value, for Cole and his fellow workers at the Rockefeller Institute have shown that positive blood cultures in lobar pneumonia are found only in severe cases, and are of grave prognosis. The mortality amongst those cases with positive blood cultures was about fifty-five per cent.; in those where blood cultures were negative about eight per cent. After weighing the evidence for and against, Percy Kidd, in his Lumleian Lectures (1912) considered that a septicaemic origin of lobar pneumonia supplied the best explanation.

Up to the present no one has yet been able to produce lobar pneumonia by intravenous injection of pneumococci; Wadsworth in 1913, Rasquin in 1910, Armstrong in 1914, and Sisson and Walker in 1915, all failed in their attempts to do so. To quote Wadsworth: "Experimental support of haematogenous infection in lobar pneumonia is certainly very meagre, uncorroborated and relatively insignificant. Finally, suffice it to note that, clinically as well as experimentally, pneumonic lesions of the lobar type are uncommon in races or individuals very susceptible to systemic pneumococcus infection, and more common in resistant individuals or species in which systemic infections are less usual." In 1920, Blake and Cecil caused a temporary or persistent septicaemia in monkeys by intravenous or subcutaneous injections of virulent pneumococci, but no pulmonary lesions resulted. Injected intratracheally, the same cultures caused lobar pneumonia. They conclude that the invasion of the blood stream by the pneumococcus in lobar pneumonia is secondary to infection of the lungs.

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*Read before the Osler Reporting Society, Montreal, June 1st, 1923.

Amongst the earliest of those who attempted to produce pneumonia by the injection of pneumococci was Gamaleia in 1888. This was done through the chest wall and caused patchy pneumonia. Intratracheal injections failed at his hands. Bosc and Galavielle produced purulent bronchitis, patches of broncho-pneumonia, and, in some instances, lobar pneumonia by intratracheal injection of guinea pigs with virulent cultures of *B. tetragenous.* Wadsworth experimented upon rabbits in 1903, animals very susceptible to infections of the pneumococcus, and showed that intratracheal injections of cultures of very low grade virulence were harmless, those made with very virulent strains caused a total bacteriaemia with no definite pneumonia. On the other hand, if just the right degree of virulence was hit upon for these injections, a small area of central "pneumonitis" resulted. If the rabbits were immunized first and then given intratracheal injections of 1 cc of very virulent pneumococci, the animals did not die of a bacteriaemia, but, on the contrary, the infection was, so to speak, held up in the lungs. None died, but a serious illness lasting 24-36 hours resulted and the animals that were killed on the third or fourth day all showed "acute diffuse pneumonitis"—once involving the whole of one lung and never less than a quarter of one lobe. The immunity had been raised by previous vaccination and the infection confined to the lung.

In 1909, Lamar and Meltzer produced a diffuse evenly distributed lobar pneumonia in dogs by injecting 5 to 10 cc. of a culture of a very virulent pneumococcus by means of a tube thrust down through the larynx as far as the bifurcation of the trachea. One animal died on the third day and besides the pneumonia, fibrino-purulent pleurisy, pericarditis, and septicaemia were found. Nine other dogs were killed on the first to sixth day of disease and none of these had septicaemia. In a further paper (1912) Lamar and Meltzer concluded that for the successful production of pneumonia it was necessary to inject a quantity of culture sufficiently large to obliterate a group of small or even of large bronchi, smaller quantities generally failing to call forth a pulmonary reaction. The pneumonia produced ran a milder and shorter course than in man. Ten cases were fatal and in all but three of these a septicaemia was found. Winternitz and Hirschfelder, using the same method, produced, in 1913, a pneumonia in rabbits. In this, animal blood cultures were positive whenever made. Meltzer reviewed his extensive work in 1914 and showed that he was able to cause lobar pneumonia by tracheal insufflations of the pneumococcus, the pneumobacillus, or the streptococcus mucosus. With the streptococcus, a staphylococcus or influenza bacillus either a bronchial or lobar type of pneumonia was produced, depending upon the amount and virulence of strains used. If pneumococci that were not very virulent were employed no positive blood cultures were obtained in the first forty-eight hours and less fibrin was seen in the pneumonic exudate. If virulent pneumococci were used, blood cultures were positive in the first forty-eight hours, but were consistently negative from the third day on, except in those cases which had a fatal issue. By removing the lower ribs of a dog, Meltzer was able to watch consolidation of the lung develop within four to fifteen hours after insufflation and could hear blowing breathing, etc.

Kline and Winternitz dealt, in 1913, with the question of the importance of leucocytes in experimental pneumonia. Those animals in which a preliminary leucopenia was induced by injections of benzol rapidly succumbed to experimental pneumonia. On the other hand, those that were given toluol repeatedly, or in those where a hyperleucocytosis was caused by repeated injections of nutrose, resistance to pneumonia seemed to be increased.

We come now to the most important work that has yet been done in experimental pneumonia, namely the experiments upon monkeys of Blake and Cecil, the results of which were published in the *Journal of Experimental Medicine* during 1920. Previous work had blazed a trail but it was not detailed enough. The amounts of culture injected were not rigidly controlled, clinical observation of the animal was not minute, and bacteriological study of the animals while living and at autopsy and histological investigation of the tissues were not complete until Blake and Cecil performed their experiments. Again, these two worked with anthropoids and the fact is of the greatest significance for the ultimate aim of all these studies has always been the elucidation of the pathological processes of pneumonia in man himself.

The intratracheal injections were made by thrusting a dry needle directly into the trachea just below the larynx. One cc. of fluid was always used, but the amounts of a virulent culture of an eighteen hour plain broth growth, which it contained, varied from one millionth of a cc. to one cc. The four types of pneumococci were employed in different experiments. Thirty-seven monkeys received injections and all got pneumonia save five. The clinical picture was that of lobar pneumonia in man and Blake and Cecil's charts bear this out in a remarkable way. Rise of temperature began within twelve to sixteen hours; those monkeys that recovered generally showed a typical crisis. In the majority of instances pneumococci were found in the blood stream within six to twenty-four hours after injection, presumably the organisms gained access to the blood vessels from the lymphatics draining the lungs; this supposition receives support from microscopical study of sections of the lung in the earliest stages of experimental pneumonia. This septicaemia was transient in most of the monkeys that recovered. A persistent septicaemia with a rising leucocyte count during the latter part of the disease was nearly always associated with such a complication as empyema or pericarditis. Blake and Cecil made an interesting observation, viz., as a rule the blood cultures ceased to be positive before the crisis, but in other instances they remained positive after the crisis. H. M. Thomas, (Jr.) and Parker, have shown in man that cultures from lung-puncture fluid may be positive or negative just before or just after the crisis. This is a somewhat similar finding to that of Blake and Cecil and it would appear that in the recovery from lobar pneumonia there are two mechanisms, a "bactericidal" and a "detoxifying.

Intratracheal injections of sterile broth, of killed pneumococci, and of living avirulent pneumococci produced no pneumonia. Healthy animals were placed as controls in the same cage as those in which lobar pneumonia was developing but only one showed pneumonia. Spraying of the nose and throat of healthy monkeys with virulent pneumococci caused no pneumonia and no infection of the upper respiratory tract. Therefore, the barrier of the nose and throat must be passed to produce pneumonia, but once the pneumococci reach the trachea (as was consistently shown in the animals that were injected intratracheally) lobar pneumonia is quickly produced in monkeys.

Blake and Cecil also performed experiments upon healthy monkeys using cultures of virulent haemolytic streptococci; the organism is less virulent for monkeys than the pneumococcus so it was found necessary to inject from 0.1 cc. to 10 cc. of an eighteen hour plain broth culture. Only three monkeys died out of the nine monkeys injected intratracheally and these three received streptococci in large doses. These results are not surprising in view of the fact that the *Streptococcus haemolyticus* is rarely virulent enough to cause a primary pneumonia in man and the disease is generally secondary to measles, influenza, etc. Sterile blood cultures from the monkeys throughout the course of the disease were the rule. Lobar pneumonia was never produced but simulated streptococcal pneumonia as seen in man. At the most, i.e., following very large doses of streptococci, a widespread confluent lobular pneumonia, accompanied by necrosis, resulted. By using the smallest doses merely an interstitial pneumonia was caused, but with somewhat larger ones the lesion passed from a purely interstitial one to that of a mixed interstitial and lobular pneumonia. Again, as in the case of the pneumococcus, spraying of the nose and mouth of healthy monkeys failed to produce a pneumonia or even an infection of the upper respiratory tract.

Finally, Blake and Cecil were able to produce a pneumonia in monkeys after injections of the *Bacillus influenzae* of Pfeiffer. The strain came originally from an empyema in a child but its virulence was heightened by repeated passage through mice and monkeys. The growth of an agar plate was employed and a bronchopneumonia, like that caused by the same organism in man, was produced in seven out of a total of ten monkeys that received an intratracheal injection. The disease was not fatal, but one case showed pericarditis and septicaemia due to *B. influenzae*. By swabbing the nose and throat with a culture of the organism or by dropping the culture on to the mucous membrane with a pipette an upper respiratory tract infection, similar to a mild influenza in man, was produced; occasionally a tracheo-bronchitis and, in one case, a bronchopneumonia resulted. This monkey showed a sinusitis of the antrum.

We now turn to the pathology of the experimental pneumococcal pneumonias produced by Blake and Cecil in monkeys. Forty autopsies were performed, twenty-seven upon animals that had died and thirteen on animals that were killed at various intervals of time after the crisis or on those that were killed on the first to ninth day of disease. In this way it was possible to see the pulmonary lesions at all stages in their evolution.

In three very mild cases, which appeared clinically like abortive attacks of pneumonia, the lungs showed interstitial inflammation only with little or no exudate in the alveoli. The earliest stage, then, was thickening of the vascular adventitia and walls of the bronchi *close to the hilum.* This engorgement extended outwards in the lobe and preceded exudation into the alveoli. The interlobular septa were involved in the same way but to a less extent. The thickening of the interstitial tissues was caused by oedema, leucocytic infiltration, and intense capillary engorgement. Red hepatisation always began close to the hilum of the lung before the interstitial engorgement was completed throughout the lobe, for this was seen in monkeys that died early in the course of the disease. Surrounding those alveoli which showed red hepatisation were those which were oedematous but contained no red cells. In the more distant parts of the lobe, although there was engorgement of the interstitial tissues and of the alveolar walls, the alveoli themselves contained no exudate and not even oedematous fluid. Later on, red hepatisation close to the hilum gave place to grey hepatisation, and red hepatisation appeared at the periphery of the lobe. In the monkey, then, *consolidation is a centrifugal process in all its stages.* The microscope confirmed the naked eye findings, i.e., an interstitial involvement was the first stage and this at first only at the hilum. Sections made at one very early autopsy (three hours after intratracheal injection) showed the pneumococci penetrating the walls of the bronchus at the hilum and thus gaining access to the supporting structure of the lung, the organism were being carried out along the lymphatics and in later stages *could be seen in the walls of alveoli* inside of which there were no organisms or exudate. The exudate of red cells, and later of leucocytes, appeared in the alveoli before it did in the bronchioles. When grey hepatisation was complete throughout the lobe the interstitial tissues and alveolar walls were less congested.

I have dealt at some length upon the stages of the processes leading up to consolidation; most important is the fact that the pneumococci are not borne throughout the lobe along the air passages, but are carried out by the lymphatics.

Complete autopsies were also performed at different stages of the streptococcal pneumonias produced in monkeys by intratracheal injections. The mode of invasion is the same as in the case of the pneumococcus, i.e., through the wall of a large central bronchus into the interstitial tissues and again when infection of the alveoli takes place it is through the alveolar walls. There is a constant tendency, however, for the tissues to form barricades against infection by the streptococcus and unless the infection is very virulent we do not see hepatisation spreading so rapidly throughout the whole lobe as in the case of the pneumococcal infections. In mild cases, although the interstitial engorgement may be pronounced, it is only alveoli close to the bronchi, close to the vessels, to the septa, and to the pleura that contain exudate. Invasion of the cavity of the bronchiole is not primary but follows infection of its walls by lymphatic extension from the hilum. Only when resistance gives way do we find a spreading lobular pneumonia. On account of the barricades thrown up against the streptococcus, extensive damage to the walls of the bronchi and bronchioles results, engorgement and haemorrhage are more marked than in the pneumococcal cases, and even alveolar necroses and small abscesses are formed. These latter are rare in the pneumococcal pneumonias. As a result, on healing or organization with the production of fibrous tissue, more permanent damage is done to the lung in the streptococcal cases.

The morbid anatomy of the pneumonias caused in monkeys by *B. influenzae* differs remarkably from that caused by the pneumococcus and the streptococcus. The disease commences with a tracheo-bronchitis. There is intense engorgement, haemorrhage and oedema, purulent bronchitis, scattered foci of peribronchial consolidation, and, as a result of all this, there is left on healing a patchy emphysema and bronchiectasis. The pathology of this pneumonia is very similar to that seen in nine fatal cases of bronchiolitis and bronchopneumonia occurring before the pandemic of influenza described by the present writer and Dr. Rhea.

As opposed to the pneumococcus and streptococcus, *B. influenzae* of Pfeiffer travels down the bronchial tree into the bronchioles and subsequently involves the alveoli that are contiguous.

In the pneumococcal and streptococcal cases the organisms penetrate the bronchial mucous membrane almost at once and spread rapidly through the perivascular lymph spaces to the alveolar walls and this in all parts of the lobe in the case of the pneumococcus especially. *B. influenzae* are found in large numbers in the alveoli. The lymphatics and interstitial tissues are noticeably free of these organisms as MacCallum pointed out in his study of cases in man, therefore, they are less liable to invade the general circulation.

Finally, I should like to point out that Dr. Howard Mason, of New York, showed, in 1916, by X-ray photographs of lobar pneumonia developing in children, that consolidation begins beneath the pleura and extends in towards the hilum. In his opinion central pneumonia in the strict sense of the term, never occurs, and silent consolidations are subpleural ones and are separated from the hilum by normal lung, and not till consolidation extends inwards are bronchial breath sounds transmitted to the ear. Cecil, in 1920, referred to these observations of Mason but states that in his and Blake's experiments they were never able to demonstrate an infection beginning at the periphery of the lobe. Other workers such as Sieler, Roubier and Caste, of Lyons, and Mouriquand, have demonstrated by the X-rays in cases of lobar pneumonia in adults that the process of consolidation was a centrifugal one.

Insulin Treatment of Post-Operative (Non-Diabetic) Acidosis.—William Thalhimer, Milwaukee, has treated three cases of post-operative acidosis with insulin, causing almost immediate cessation of vomiting and ketosis. The improvement in two cases was quite as rapid and dramatic as is caused by insulin in diabetic coma. In the third case, the improvement was as rapid at first with a small dose of insulin, but the condition rapidly cleared up with larger doses.—*Jour. A. M. A.*, Aug. 4, 1923.

Catharsis in the Treatment of "Colds."—The almost universal use by physicians and laity of laxatives and cathartics in the treatment of acute upper respiratory tract infections (so-called "colds") suggested an investigation to Hugh Macdonald, Evanston, Ill., to determine how large a rôle this therapy played in shortening the duration of these conditions. A mild epidemic of acute respiratory infections furnished an opportunity to investigate this problem among the employees of a large industrial organization in Chicago. In most of the cases under observation there was a more or less generalized infection of the whole upper respiratory tract before the termination of the illness. Information on fifty-one practically consecutive cases occurring during the height of the epidemic was obtained. Thirty-seven persons had used cathartics, mainly at the onset of the illness. The average duration of unemployment of this group was nine days. Fourteen had used no cathartics. Their average duration of unemployment was 7.71 days—14.3 per cent. less than the former group. While it is not claimed that the omission of cathartics will hasten the subsidence of definite symptoms, it is suggested that omission of cathartics in the absence of constipation in the treatment of "colds" does not apparently delay recovery.—*Jour. A. M. A.*, May 12, 1923.

Multiple Tuberculous Bone Lesions Complicating Chronic Pulmonary Tuberculosis.—A case of chronic pulmonary tuberculosis is cited by Joseph Rosenblatt, Wallum Lake, R. I., in which there was metastatic involvement of most of the ribs, the left clavicle, the frontal bone and the thyroid cartilage. The recent literature did not disclose any record of a similar case. One of the most unusual features of this case is the spontaneous fracture of the clavicle. Tuberculosis is hardly ever mentioned as a cause of spontaneous fractures. In this case, however, the involved bones were rarefied and brittle without any gross evidence of new bone formation. It is not surprising, therefore, that the weight of the arm and muscular action were sufficient to break the diseased clavicle.—*Jour. A. M. A.*, July 21, 1923.

Editorial

RECENT RESEARCH IN THE ETIOLOGY AND PREVENTION OF RICKETS

A VERY valuable research into the causes which underlie the development of rickets has been recently undertaken in Vienna under the auspices of the Medical Research Council of Great Britain and the Lister Institute. Information reached London shortly after the close of the war that rickets was prevalent in Vienna, and the Medical Research Council, which has been carrying on investigations into the etiology of this disease promptly sent a small committee of lady physicians to Vienna to carry on a careful research in association with representatives from the Accessory Food Factors Committee. The report is extremely interesting, detailing one of the most complete studies of human rickets ever undertaken, and presents us with definite knowledge regarding both the etiology and early diagnosis of this disease.

The investigators were fortunate in being able to work in the University Kinder Klinik, under Professor von Pirquet, well known in America, and who at one time held a professorship in Johns Hopkins University. Sixty cots were allotted to them in two separate hospitals under the same conditions of hygiene and an altogether exceptional system of diet control. The investigation consisted in a careful observation of about seventy young infants for periods varying from six months to a year. They were for the greater number babes from the slums and on admission were in poor condition but free from rickets, and were all bottle fed on one of two diets. Diet I consisted of fresh undiluted milk of stall fed cows, sterilized and supplemented by large amounts of cane sugar; after the child was five months old cooked starch in various forms was added. Diet II was a full cream dried milk, reconstituted by the addition of water and in young infants supplemented by the addition of sugar; and after six months by the gradual addition of starchy foods. Experiments on rats showed that both diets had a low value in fat soluble vitamin A, every infant on Diet II received in addition a daily ration of cod liver oil up to one and a half drachms of pure oil given in an emulsion. Thus supplemented, Diet II was notably richer in fat soluble vitamin A than Diet I. Expressed in calories the percentage of the constituents in the two diets varied as follows:

Diet I.—Protein 13, Fat 28, Carbohydrate 59.
Diet II.—Protein 20, Fat 45, Carbohydrate 35.

Thus Diet I had a high carbohydrate and a much lower content of fat and protein. The caloric value of both diets was high: that of Diet I was five to ten per cent. higher than Diet II, owing to the high proportion of cane sugar.

The important facts obtained by this prolonged study was the comparative freedom as indicated by the radiographic plates of the children during the bright summer months from the development of this disease, but in the dark winter months from December to May, seventeen infants, about fifty per cent. of those on Diet I without cod liver oil, developed rickets, and in twelve of these the radiographic diagnosis was made under seven months of age, while the group fed on Diet II with cod liver oil remained free. A further series of observations of breast fed babies under poor hygienic conditions showed that rickets (clinically diagnosed) was common in winter and not rare in summer, and in these cod liver oil was not a perfect prophylactic.

Miss Dalyell and Miss Mackay lay

special emphasis on craniotabes as the earliest sign of developing rickets at least in infants under six months; enlargement of the costochondral junctions, though occurring later between five and six months, was also of value, though confusion here may be caused by physiological or scorbutic enlargement.

The standard of cure was as far as possible radiographic evidence. Spontaneous cure was observed in spring and summer, when babies were much out of doors and on either diet. Diet II containing cod liver oil was curative in winter; while Diet I failed to cure. In winter and spring, babies on Diet I were also cured by cod liver oil or by exposure to sunlight or by the mercury vapour quartz lamp; treatment by sunlight was on the whole, however, more efficacious than the quartz lamp. The imperfect protection afforded by cod liver oil under poor dietetic and hygienic conditions is admitted.

The following factors are emphasized as playing an important part in the etiology of rickets: (1) An organic factor in diet concerned with the calcification of bone; (2) deficiency of sunlight; (3) an inadequate amount or an imperfect balance in the diet of the salts of calcium and phosphorus. Francis Glisson associated rickets nearly 300 years ago with moist and foggy climates, and this appears now as a shrewd guess that hit the very truth. The infant without sufficient exposure to sunlight when fed on either good human or cow's milk has only a narrow margin of safety.

Dr. Dalyell and Dr. Mackay in their description of the clinical signs of rickets imply that cranio-tabes, softening of the outer ends of the occipito-parietal sutures, was the earliest sign and was often observed between three and five months; its persistence indicated that the disease was progressing. In older infants it might be absent, and definite rickets be present elsewhere. Enlargement of the wrists and ankles seldom occurred before the end of the first year and could be detected by radiograph, before it could be verified by clinical observation.

The period of infancy at which rickets develops is, therefore, of clinical importance for at different ages the criteria of diagnosis will change, and the disease will be manifested chiefly in those parts of the bony skeleton which at the time are growing most rapidly. It is evident also that in Vienna, if not elsewhere, rickets may affect infants at an earlier age than has hitherto been recognized.

Von Pirquet in his foreword to the present report states that while previous to these researches of Dr. Harriette Chick and her colleagues he was of the opinion that rickets was of an infectious origin, he has been convinced by the results obtained in their three years of conscientious work, that the disease is definitely associated with a diet poor in fat soluble vitamins, and with absence of sunlight.

INFANTILE MORTALITY AND STERILITY

WE desire to call attention to the facts brought out in the discussion which took place at a meeting of the Section of Obstetrics and Gynaecology of the Royal Society in England, a few months ago, and also at the recent meeting of our own Association. It is a subject in which the profession has much to say, not only as it affects the State but also for its influence on family life, so far as the results of sterility have a bearing on the power and the material and mental effectiveness of a State, the question may perhaps be regarded from a different point of view in England from what it should be in Canada. Voluntary limitation of conception is unfortunately more often made use of by those who can well afford to have children and educate them well than by those of limited means, who cannot afford to have children and who have not the desire nor the ability to bring them up to be useful to the State. It will be a sad time for any State if the control of the Government passes out of the hands of the educated and patriotic, and into the hands of the ill-educated, self-seeking, and unpatriotic—a result which may be only partly prevented by education, for certainly heredity plays an important part in the after development of the child.

In this problem the profession in Canada must exert their influence to impress upon state authorities and upon responsible individuals that everything which advanced science can do to promote health in those who can or are about to be mothers should be effected; healthy bodies free from disease, sanitary surroundings, proper food, exercise, and, in those who labour, sufficient hours of rest. One of the speakers in England asserted that the percentage of sterility is the index to the morals of a nation. This statement with a certain amount of limitation will by the majority of the profession be regarded as true. In regard to the heavy infant mortality which exists in many cities and districts in Canada there can be but one opinion. It is disastrous and must be controlled. While the profession may do much to effect improvement, the State also should come forward with advice and financial assistance, we desire to emphasize the importance of every School of Medicine in Canada giving more attention to the education of the student in the necessary prenatal care of the mother, and the postnatal care of the infant as well as of the mother. The many problems of infant feeding are not sufficiently taught in the majority of our schools at the present. Paediatrics is one of the most important departments in medical teaching, and the great importance of promoting child welfare should be the aim of every physician and every medical society.

PITUITRIN

JUST about a century ago the ergot of rye, long known on the continent as a remedial agent in the hands of midwives, and later employed in obstetric practice by physicians in France and America, was introduced into England, and in 1828 Mitchell, in a work entitled "On the Ergot of Rye" expressed the opinion that its general introduction would so completely supersede the use of forceps that "it would not be surprising if in twenty years that instrument be known only by name, and again, except in the rare cases in which the Cesarean operation was formerly recommended, he conceived that there would be now no need for instrumental aid in midwifery. Twenty years passed, but Mitchell's prediction was not fulfilled. On the contrary, Ramsbotham, the first secretary of the Obstetrical Society of London, declared that ergot possessed such a strong influence over the uterine system that, if exhibited improperly, it was likely to do great injury. Disproportion between the head and the pelvis, rigidity of the parts—cervix, vagina, or perineum—malpositions of the head, were all contraindications to its use. It might be advisable occasionally in breech presentations, but never in transverse positions, and its sole value lay where the uterine action was feeble.

The present teaching regarding ergot is usually summed up in "Never give ergot until the uterus is empty." Pituitrin seems to be going through the same stages. Probably no drug has had such wide obstetric use as this extract of the pituitary gland. Practically all the claims made for ergot have been made for pituitrin, and it would appear that approximately the same time must elapse before the grave danger of its indiscriminate use will be universally manifest.

Let it be remembered that pituitrin is not standardized, that occasionally it may produce no effect, that even with active pituitrin its effect may be evident only after from eight to twenty minutes; but, when it does act, it is more powerful than ergot, more prone to produce tetanic contractions, and the action may be unduly prolonged.

There are on record many reports of rupture of the uterus after even one dose of pituitrin, of extensive damage to the maternal tissues from too rapid expulsion of the child, and, in one instance at least, of the onset of convulsions after the administration of one dose of the drug. The children in many cases, even those born spontaneously, are not infrequently the victims of meningeal and cerebral haemorrhages, convulsions, paralysis, or death.

For the control of bleeding, by causing forcible contractions of the uterine muscles, it is undoubtedly of value in many emergencies, and many of the better obstetricians believe in injecting the incised uterus after removal of the child in Cesarean section, but it is doubtful whether the two large classes of cases, notably those where induction of labour seems indicated, reported by Watson, and those where prophylactic injection at the beginning of the third stage is advocated by Ryder, Brodhead, and Langrock, of New York, might not be as satisfactorily even if not more safely managed by other means. The success of induction of labour by the use of castor oil, quinine, and pituitrin, is not more satisfactory than when castor oil and quinine alone are used, and as to haemorrhage in the third stage it is our belief that the fear of haemorrhage is not the least important factor in its causation. H. M. L.

Editorial Comment

HELP FOR MEDICAL MEN IN RUSSIA

An earnest effort is being made by the Medical Division of the American Friends Service Committee (Quakers) to collect money, clothing, instruments, books and journals for the benefit of the medical profession in Russia. We are in receipt of a letter from a well known professor in Johns Hopkins University, requesting a personal effort from every physician who has it in his power to aid these *confrères*. He writes that the condition of these men is deplorable. Removed happily to a great extent by the nature of their profession from the political disturbances of the past six years, they have suffered doubly. While the demands for assistance have multiplied greatly, they have been deprived, not only of the bare necessities of life, but are in dire need of drugs, medical and surgical instruments, and of good medical literature. The Quakers assert that they are in a position to assure the American profession that contributions will be promptly and efficiently distributed where it will do most good. The writer ends his persona letter by stating: "It is not a charity; it is a duty." The Quaker relief workers will directly supervise the distribution.

VENEREAL DISEASE

The statement is made by the committee appointed a year ago by the Ministry of Health in England to inquire into and report on the best medical measure for the prevention of venereal disease in civilian communities, that while there is no absolute prevention except continence, and that the success of all medical measures will depend on the cooperation of the community, measures should be taken by the State to diminish all conditions of life which tend to foster promiscuous sexual intercourse, and in this way the spread of disease. With regard to prevention, the committee thinks that a man who, after exposure thoroughly and promptly uses disinfectants runs little risk of infection. In syphilis, disinfection within an hour would be generally successful, and in gonorrhoea there is prospect of success after a somewhat long interval. It is extremely difficult for a woman to disinfect herself, and the prospect even in skilled hands is more doubtful than in the case of a man. The commercial advertisements of *ad hoc* disinfectants should be prevented, but druggists may be allowed to sell disinfectants approved of by competent authority. Public funds spent in facilities for self-disinfection they regard as less profitable than money spent either on treatment or on measures for the education and improvement of social conditions. The entry of persons into the community suffering from venereal disease should be prevented, the efficient treatment of seamen with venereal disease demands careful thought and perhaps special measures for disinfection.

Methods of Demonstrating the Circulation in General.—Frank Hinman, Duncan M. Morison and R. K. Lee-Brown, San Francisco, describe in detail the celloidin injection method which they use in their work. As an injection method, celluloid corrosion is said to possess these advantages: 1. The gross architecture as well as the minutest ramification of the vascular tree can be demonstrated. 2. Differentiation of structure can be clearly shown by the introduction of a dye. 3. The specimens prepared to show gross structure are not brittle or easily distorted. They are permanent, light and resilient, and can be handled; they are excellent, therefore, for demonstration purposes. 4. The ramifications of vessels, no matter how tortuous or numerous, can be easily traced throughout to their ultimate distributions. The advantages and technique of the dye injection method in duplicating capillary and minute structural conditions, and the value of the barium sulphate stereopticon are also discussed. The authors use a thin suspension of barium sulphate in a 50 per cent. aqueous solution of sodium bromid. Barium sulphate, while not necessary so far as the roentgenography is concerned, is added for two reasons: 1. The degree of capillary injection can be controlled by increasing or decreasing the amount in suspension. Pure solution of sodium bromid passes over too readily into the venous system. 2. By its addition, the progress of the injection can be followed (white suspension), and any leaks in the system at the time of injection readily detected. For the demonstration of the capillary distribution, a 2 per cent. solution of soluble Berlin blue (or soluble Prussion blue, chemically pure) in distilled water is used. The followed advantages are presented by this particular solution: 1. Complete injection of a vascular system to the finest capillaries may be obtained without the slightest diffusion. 2. Its preparation is the simplest possible. 3. The pressure required for complete injection is a minimum. 4. It is chemically inert, having no action on the tissue, such as the coagulation produced by silver nitrate. 5. It is not affected by any of the reagents subsequently employed. 6. Splendid contrast stain may be obtained when employed together with carmin or silver nitrate.—*Jour. A. M. A.*, July 21, 1923.

The Inhalation of Vegetable Dust, Mill Fever. Various forms of hay fever result in large part, at least, from the inhalation of the pollen of plants. Injurious effects are similarly produced by the inhalation of vegetable dust in factories. The vegetable fibres used in the manufacture of clothing are cotton, jute, flax, and hemp. In the preparation of all these fibres and in the mechanical processes necessary to their conversion into cloth more or less dust is produced. Formerly a large percentage of the workers making up these vegetable fibres constantly inhaled the finely divided dust while at work in the factory. Many of the beginners suffered from a low fever known as "mill-fever." Some of them acquired asthma in much the same way that this disease is caused by the inhalation of pollen.—*Hygeia.*

Correspondence

ERYSIPELAS *vs.* CANCER

To the Editor:

The *Canada Lancet and National Hygiene*, in July Number, refers to Professor Roberts, of Edinburgh, and Dr. E. W. Simpson, in regard to a new cure of paralysis of the insane by injecting into a victim of this disease living germs taken from a patient suffering from malaria.

Several years ago a retired lumber merchant, aged about seventy, noticed the slow growth of a tumour on the left side of the face about midway between the eye and ear. There was considerable pain with ulceration and discharge of blood, and pus. He was then living in Buffalo, and consulted a number of physicians but refused any operation. He returned to Toronto, consulted the writer, and as his condition was getting worse he submitted to surgical aid, and at the Western Hospital the morbid mass was removed. The morbid process reappeared in a short time. Patient and physician gave up all hope of a cure. However, some weeks later the patient became infected with a virulent attack of facial erysipelas. The temperature was very high, and there was intense hyperaemia of the face. He recovered in about three weeks and, to the great delight of patient, physician, and nurse, there was not a trace of the former morbid process. The cavity had filled up with normal tissue, and was covered with healthy skin. The patient lived several years without the slightest sign of any return of the morbid process, and died of angina pectoris.

This case presented all the classic "hallmarks" of cancer. All treatment by a number of competent physicians and surgeons was useless but it was completely and permanently cured by an attack of erysipelas. The results obtained from the injection of the living germs of a malarial patient in cases of paralysis of the insane would seem to indicate that the injection of the more virulent germs of erysipelas might destroy the less virulent "aggregation of germs" in cancer.

The cure of this patient through the advent of erysipelas was so prompt and effective that should the writer ever become the victim of cancer—incurable by surgical, and medical methods, he hopes his medical attendant will have "the nerve" to inject living erysipelas germs.

JOHN HUNTER, M.B.

Toronto, Ont., July 25th, 1923.

Fatal Haemorrhage from Eroded Arteria Cystica of the Gall-Bladder.—In the case cited by Richard H. Jaffé, Chicago, two ulcers were present just above the pylorus. One of them was located on the posterior surface. Its floor was formed by the pancreas. The other ulcer involved the lesser curvature and a considerable part of the anterior wall. It entirely penetrated the wall of the stomach. Its base consisted, in the lower part, of liver tissue deprived of the capsule and ulcerated; in the upper part, of the gall-bladder. The wall of the gall-bladder was there changed into a blood-stained ulcer, in the centre of which gaped the lumen of an eroded artery. This proved to be the arteria cystica, a branch of the arteria hepatica.—*Jour. A. M. A.*, May 12, 1923.

Value of Carbon Tetrachlorid as an Anthelmintic.—Several hundred men who had been exposed to hookworm infection previous to imprisonment and who had been in custody for from three months to three years were chosen by J. F. Docherty, Ceylon, to try out various anthelmintics, thymol, chenopodium, betanaphthol and carbon tetrachlorid. Carbon tetrachlorid proved to be the most efficient anthelmintic in 3 c.c. doses. The anthelmintic value of carbon tetrachlorid is practically unaltered by differences in the number of worms harbored. The apparent futility of prolonged treatment was well demonstrated, likewise that a 3 c.c. dose of carbon tetrachlorid does not produce any lesion of the kidney.—*Jour. A. M. A.*, Aug. 11, 1923.

The Association

REPORT OF THE ANNUAL MEETING OF THE ASSOCIATION HELD AT MONTREAL

June 12th to 14th, 1923

FIRST MEETING OF EXECUTIVE COMMITTEE, JUNE 11th

The following members of the Committee were present: Drs. Martin, Reilly, Archibald, Roy, Starr, Secord, MacEachern, Maclean, Routley. On motion duly moved, seconded and carried the minutes of the last meeting of the Executive Committee were taken as read.

It being the purpose of this Executive Committee to receive, consider and prepare the business for the afternoon meeting of the Council, the following *agenda* were taken up *seriatim:*

(1) Reading of Minutes.
(2) Business arising out of Minutes.
(3) Canadian College of Physicians and Surgeons.
(4) Affiliation Canadian Radiological Society.
(5) Lister Memorial.
(6) Code of Ethics.
(7) Insurance Examination Fees.
(8) Canadian Medical Directory.
(9) Bond Issue.
(10) Affiliation of Quebec Medical Association.
(11) Amendments to Constitution—Vancouver, Halfax, Winnipeg, Montreal.
(12) Travelling expenses being deductable for Income Tax Purposes.
(13) *Re* appointment of General Secretary.
(14) Report of the Executive Committee.
(15) Vote of Sympathy—Mrs. Scane.
(16) Invitation to British Medical Association to meet in Canada in 1926.
(17) Minimum Fee for Life Insurance Examinations.
(18) Workmen's Compensation Board Fees.
(19) Income Tax.
(20) Medical Legislation.
(21) Visitation to Provinces.
(22) Report of the Committee on Inter-Provincial Relations.
(23) Report of the Committee on Necrology.
(24) Report of the Committee on Federal Legislation.
(25) Report of the Committee on Education.
(26) Report of the Committee on Constitution and By-laws.
(27) Report of the Treasurer.
(28) Cost of the *Journal.*
(29) Proposed Affiliation with British Medical Association.
(30) *Journal* News Items.
(31) Invitation for the Meeting of 1924.
(32) Provincial License Inspectors.
(33) Fee Splitting.
(34) Courtesy to Medical Missionaries.
(35) Three Governors to the American College of Surgeons.
(36) Financial Advice in *Journal.*
(37) Letter—Toronto Publicity Bureau.

As all items on the above Agenda were disposed of at later meetings of the Executive Committee or Council, we are merely publishing the final decision of the respective body. (*Ed.*)

FIRST MEETING OF COUNCIL, JUNE 11th, 2 P.M.

The President was in the Chair and the following gentlemen answered to the roll call: Drs. C. F. Martin; T. C. Routley; T. G. Hamilton; E. R. Secord; J. A. MacKenzie; N. J. Maclean, J. S. McEachern; F. N. G. Starr; A. T. Bazin; W. G. Reilly, E. W. Archibald; E. J. Ryan; J. F. Argue; F. W. Marlow, A. Primrose; P. D. Stewart; J. H. Mullin; F. Miller; G. S. Cameron; G. Melvin; J. Roy.

The President having reported to the Council that the Executive Committee had received and considered *seriatim* the clauses on the *agenda* now presented for the attention of the Council, it was decided to again take up the clauses *seriatim* with such report as the Executive Committee had to offer on the various clauses, considered by them. Before this was done, it was duly moved, seconded and carried that the various minutes of the Council be taken as read.

CANADIAN COLLEGE OF PHYSICIANS AND SURGEONS—Dr. Marlow, Chairman of this Committee reported that no action had been taken by the Committee during the past year, but suggested that the Committee be continued in office in order that the matter might not be dropped. *Dr. Bazin:*—Has the Committee considered the advisability of a Fellowship of the Canadian Medical Association, being formed which might cover the ground and not be too legal? *Dr. Marlow:*—The Committee will be glad to consider this matter at a future date.

Moved, seconded and carried that the Committee be continued in office, that they be asked to ascertain what may be done in the matter.

AFFILIATION CANADIAN RADIOLOGICAL SOCIETY—Moved, seconded, and approved.

CODE OF ETHICS—The Secretary reported that the *Code of Ethics* had been sent to all members.

INSURANCE EXAMINATION FEES AND MINIMUM FEE FOR LIFE INSURANCE EXAMINATIONS—The Secretary reported that the Companies are unwilling to grant a minimum fee of $5.00 for insurance examinations. Dr. Reilly was of the opinion that we could secure this if medical men would work together.

CANADIAN MEDICAL DIRECTORY—Moved, seconded and carried, that the Directory be not published.

AFFILIATION OF QUEBEC MEDICAL ASSOCIATION—Moved, seconded, and approved.

AMENDMENTS TO CONSTITUTION, VANCOUVER, HALIFAX, WINNIPEG, MONTREAL AND REPORT OF THE COMMITTEE ON CONSTITUTIONS AND BY-LAWS—The Secretary reported the amendments to Constitution which have now been incorporated in the Constitution and By-laws. On behalf of the Committee on Constitution and By-laws, Dr. Melvin submitted the following report:

Your Committee on Constitution and By-laws begs to respectfully recommend as follows:

(1) That Chapter XI—Amendments—third paragraph, be amended as follows: That all of said paragraph after the word "least" be struck out, and the following substituted therefor:—"three months before the annual meeting and shall be published in two consecutive editions of the *Journal* of the Association prior to the annual meeting of the Association. If, or as, adopted, such changes shall be published in the *Journal* of the Association within two months subsequent to the said annual meeting."

The amended paragraph will then read as follows:—"All proposed changes in the By-laws shall be in the hands of the General Secretary at least three months before the annual meeting and shall be published in two consecutive editions of the *Journal* of the Association prior to the annual meeting of the Association. If, or as, adopted such changes shall be published in the *Journal* of the Association within two months subsequent to the said annual meeting."

(2) That, as it appears by the Constitution, Article II, sub-article (*b*) the publication of a periodical *Journal* which shall be the official organ of the Association, is one of the objects for which the Association is established and that such *Journal* has been so established, and as it appears that no provision has been made elsewhere in the Constitution for the editing, control and conduct of such *Journal*, your Committee is of the opinion that due provision should be made in the Constitution for such editing, control and conduct.

To this end, your Committee would respectfully recommend that a special committee of the Association be appointed to take this matter into consideration, said committee to report its findings and recommendations to the Council of the Association in the year 1924.

(Signed) Wm. F. ROBERTS, *Chairman*,
W. H. IRVINE, G. G. MELVIN

Dr. Melvin gave notice of motion that this amendment be adopted.

Dr. Reilly gave notice of motion that in Chap. VII, sec. 6, the last line be changed from "the members of *the* Executive" to "the members of *its* Executive."

TRAVELLING EXPENSES DEDUCTABLE FOR INCOME TAX PURPOSES AND INCOME TAX—Moved, seconded, and carried, that the Secretary be instructed to take the necessary action in this matter by communicating with the Finance Minister.

APPOINTMENT OF OFFICERS—The President announced to the Council that the Executive Committee had made the following appointments: *General Secretary*, Dr. T. C. Routley; *Honorary Treasurer*, Dr. A. T. Bazin; *Editor of the Journal*, Dr. A. D. Blackader; *Managing Editor*, Dr. A. T. Bazin. Moved by Dr. Secord, seconded by Dr. Argue, that this Council approve of the action of the Executive Committee in the foregoing matters. *Carried.*

REPORT OF THE EXECUTIVE COMMITTEE—Your Executive Committee desires to report as follows:

It is with deepest regret that we record the loss by death on May 20th of our late esteemed Secretary-Treasurer, Dr. J. W. Scane. Though confined to hospital and suffering a great deal during his last eight months, he was constantly desirous of rendering what help he could to the Association and his wise counsel and advice were of material assistance to his associates in the carrying on of the work. By his death the Association has lost a valuable officer, the medical profession a worthy representative, and those of us who were privileged to know him, an esteemed and staunch friend. On behalf of the Association, your Executive Committee extends to the bereaved our deepest heartfelt sympathy.

The Associate Secretary has been carrying on the Secretarial work of the Association for the greater part of the year, latterly being appointed by the Executive Committee as Acting General Secretary.

During the past year, three meetings have been held and the routine business dealt with. In addition, a great many matters have been disposed of following conferences between the President, Secretary-Treasurer, and Associate Secretary. Early in the year, committees were appointed and it is expected that some of them will have interesting and constructive reports to present at this time.

Several months ago, a questionnaire was sent out to more than 8,000 doctors in Canada. Its contents will be fairly well known to all of our members. It had to deal largely with questions which had come up at previous meetings. A summary of the replies is herewith appended:

1.—Are you in favour of holding the annual meeting of the C.M.A. only in conjunction with the annual sessions of the respective Provincial Associations? Yes—749. No—409.

2.—If so, in your opinion, should the meeting be one of the C.M.A. in that Province for that year? Yes—612. No—135.

3.—Should the meeting be one of the Provincial Association with the C.M.A. as visitor? Yes—248. No—450.

4.—Are you in favour of the C.M.A. meeting annually independently of and apart from the Provincial Associations? Yes—335. No—407.

—Under like circumstances, biennially?
Yes—180; No—213.

—Under like circumstances, triennially?
Yes—85; No—206.

—Under like circumstances, quadrennially? Yes—45; No—582.

5.—Are you in favour of the publication of an official Canadian Medical Directory? Yes—521. No—591.

6.—Would you purchase a copy at a price not to exceed $5.00. Yes—479. No—607.

7.—Are you in favour of inviting the British Medical Association to meet in Canada in 1926? Yes—1,227. No—28.

8.—Are you in favour of a minimum fee of $5.00 for Life Insurance Examinations? Yes—1,203. No—48.

9.—Do you consider the fees paid by the Workmen's Compensation Board in your Province adequate? Yes—518. No—532.

10.—Do you think $300 per child sufficient abatement on Federal Income Tax? Yes—348. No—796.

11.—If not, what amount do you think fair? 559—$500 (plus).

12.—Have you satisfactory medical legislation in your province? Yes—314. No—551.

In studying the above replies a few observations may be in order. In the ratio of about two to one, the annual meeting of the Association in conjunction with the respective Provincial Associations is favoured, while a very large majority of those replying feel that the respective meetings should be C.M.A. meetings with the provinces acting as hosts. By a small majority, the idea of our meeting annually and independently of the Provincial Associations is not approved. The figures also indicate quite conclusively that meetings less frequent than yearly are not approved.

Opinion being almost evenly divided on the question of an official Medical Directory, your Committee do not now recommend that such a Directory be published.

A most striking unanimity of opinion is expressed in connection with the question reference inviting the British Medical Association to meet in Canada in 1926. Your Executive Committee desires to refer this question to the Council for consideration at the present time.

The minimum fee of $5.00 for Live Insurance Examinations has been almost unanimously approved. There is an almost even division of opinion regarding the adequacy of fees paid by the Workmen's Compensation Boards in the respective Provinces. In the matter of Income Tax, about half of those who replied stated that the deductable sum per dependent child should be at least $500. It would appear that about two out of every three practitioners giving the matter any thought, do not consider the medical legislation in their provinces satisfactory. No doubt all of the matters referred to will supply food for thought and discussion at this time.

During the year, your Associate Secretary has visited the Provincial Medical Associations of Saskatchewan, Nova Scotia, and Manitoba. At all of these meetings, a cordial reception was given to him and the aims and ambitions of the Association were received with every indication of being heartily approved.

Throughout the year, the Provincial Associations have been kept informed in regard to matters of national import, and at least a start has been made in laying down lines of communication which it is hoped will be perfected, whereby the whole of Canada will be linked up under the banner of a very strong national organization.

Our financial statement will not only show a very creditable balance for the last year's operations, but will also explain in detail our membership, present financial standing, etc., which is herein detailed.

Arrangements have been completed for Dr. F. J. Tees, Montreal; Dr. F. W. Marlow, Toronto; and the Secretary, to visit the four western provinces during the coming summer. Meetings will be addressed by these gentlemen as follows: Victoria, July 3rd; Vancouver, July 5th; Calgary, July 9th; Edmonton, July 12th; Saskatoon, July 13th; Regina, July 14th; Winnipeg, July 16th; Port Arthur, July 17th. This is the first time that under the auspices of the Association such a tour will have beenmade.

The Secretary has been invited and will attend the American Medical Association meeting in San Francisco as an official delegate from the Canadian Medical Association. At this meeting an opportunity will be afforded the Secretary to secure first hand information regarding the organization and methods of the American Medical Association. In addition he will give an address on graduate instruction for physicians in general practice.

In concluding, your Executive Committee, while feeling that there is ground for gratification for the progress made during the past year, expresses the hope that the coming year may show a greater desire for cooperation on the part of the profession generally. A great privilege, a real opportunity, is presented to all of us who sincerely wish to see the medical profession of this country solidly united.

Our Committee on Interprovincial Relations not only visualizes the possibilities of unity but points out in a very practical manner how we as a profession and also the public whom we serve may greatly benefit by our getting together under the banner of our national medical organization.

May our watchwords for the coming year be Organization, Progress, and Service.

All of which is respectfully submitted.

T. C. ROUTLEY, *Acting General Secretary.*

Moved, seconded, and carried, that the report be received and adopted.

REPORT OF THE TREASURER

The report which your Committee has the honour to present shows a marked improvement in the finances of the Association over las year. Whereas on December 31st, 1921, we had a bank overdraft of close to $3,000.00 at the end of the calendar year 1922, we showed a surplus revenue of $6,736.24. Receipts from subscriptions in 1922 amounted to $16,684.82 as compared to $13,554.49 in 1921. Taking into consideration the fact that in January, 1922, the annual fee was raised to $10.00, the increase over 1921 might not be considered sufficient. It must, however, be borne in mind that the decision of the Council at Halifax whereby all subscriptions became payable on January 1st, necessitated the collection of fees on a *pro rata* basis. The full ten dollar fee was, therefore, received from only about sixty per cent of our members. In addition, over 500 dropped their membership. It is of interest to note that the reason for resignation given by the large majority was the excessive fee charged by the Provincial Associations which, it was the contention, made it impossible to carry on membership in both organizations. New members added to the books numbered 291.

Receipts from advertising amounted to $16,860.02, showing an increase over 1921 of $5,633.71. Although this is an excellent showing and more than paid for the actual printing of the *Journal*, it was not sufficient to cover all additional expenses connected with the *Journal*, such as Agents' commission, the cost of illustrations and the allowance to the Editorial Board. Towards the end of 1922 a reluctance on the part of new advertising firms to take space in our *Journal* was noticeable. Investigation showing this to be due to our high charges for advertising and to a comparatively small circulation, your Committee considered an immediate remedy advisable. Consequently, commencing January, 1923, the advertising rates were lowered from ten per cent. to twenty per cent. The question of circulation, however, was a more serious one, and after due consideration, a proposition from the President of the Ontario Medical Association was approved and accepted. This, in short, was to the effect that the *Journal* should be sent free for one year to about 1,000 members of the Ontario Medical Association, who are not members of the Canadian Medical Association, the cost to be borne equally by the Canadian and Ontario Medical Associations. In sending the *Journal* free to these doctors, it is not only our object to obtain a large circulation, but to stimulate interest in the *Journal* and the Association. To this end the Secretary is keeping in touch with all who are receiving the *Journal* under this arrangement. It is hoped that by the end of the year, the large majority will become permanent members of the Association. The same proposition was made to all other Provinces, but only the Manitoba Medical Association found it convenient to enter into the arrangement. The cost of these additional thousand copies is small, averaging about $120.00 per month.

Your Committee has pleasure in stating that the lowering of the advertising rates and the larger mailing list has enabled us to obtain a number of new contracts since the beginning of the year, and, with few exceptions, retain those previously on our books.

Speaking to the Treasurer's Report, the following points were noted: Dr. Cameron suggested that the possibility of publishing the *Journal* oftener than once a month be considered. Dr. Martin pointed out two discouraging factors, one, the great expense, second, the securing of proper material. Moved, seconded and carried that the report be adopted.

Moved, seconded and carried that the Editorial allowance be increased from $1,500 to $2,000.

In connection with the Treasurer's report, it was moved, seconded and carried, that the recommendation of the Executive Committee *re* the redemption of $2,000 worth of Bonds and the placing of $2,000 in a sinking Fund be approved. (For Auditor's Statement see p. 690).

VOTE OF SYMPATHY—MRS. SCANE—Moved, seconded, and approved.

WORKMEN'S COMPENSATION BOARD FEES—Council felt that the Association should assist the Provinces in this matter. In this connection it was moved, seconded and carried that "whereas it becomes necessary at times for a Workmen's Compensation Board patient to travel to his own Province, that the incoming Executive Committee be instructed to take up with the Workmen's Compensation Board in each Province the matter of reciprocity in this connection."

VISITS TO PROVINCES—The President warmly thanked Drs. Marlow and Tees for the generous spirit they had shown in being willing to visit the West in the interests of the Association. Dr. McEachern assured the gentlemen of a hearty welcome in Calgary.

Dr. Blackader, who then came into the meeting, was accorded the privilege of discussing *Journal* matters. The Editor pointed out some of the difficulties encountered in conducting the publication and upon resuming his seat was assured by the President, and members of the Council, of appreciation of his work.

It was moved, seconded, and carried, that the appointment of Dr. Blackader as Editor of the *Journal* be heartily approved.

REPORT OF THE COMMITTEE ON INTER-PROVINCIAL RELATIONS—Moved, seconded, and carried, that the Report be taken as read. (A summary of this report will be found in the July issue, p. 525.)

REPORT OF THE COMMITTEE ON NECROLOGY—Moved, seconded, and carried, that the report be taken as read.

REPORT OF THE COMMITTEE ON FEDERAL LEGISLATION—Your Committee on Legislation begs to submit the following report:

(1) In Great Britain, the Universitites are privileged to select University representatives to parliament. Would it be in the best interests of our country that a like situation be established here? Would the presence in our parliament of learned men, carrying with them the weight and influence of the academic centres they would represent, contribute to constructive administration in our national affairs? Your Committee would recommend this matter for your serious consideration and discussion.

(2) In combatting the drug evil in our country, our Federal Department of Health shows that considerable progress has been made during the past three years. Your Committee would strongly urge that in a national way, and also acting through the respective provinces, every possible assistance be brought to bear to further cope with this great menace.

(3) Your Committee further note with satisfaction that, during the past three years registered patent medicines in Canada have been cut down from 60,000 to 6,000. This is a matter upon which the profession may look with some satisfaction, and your Committee would urge that every possible assistance be rendered the federal authorities in carrying on their work in this connection.

(4) There is a deplorable lack of accommodation in our Dominion for those poor unfortunates amongst us who become drug addicts. The Association is urged to throw its full weight and influence into any plan which may be evolved calculated to provide proper institutional care for these people. If it be a matter for the respective provinces to deal with provincially, then the Association should get behind each provincial Association which may undertake the work.

Without comment, your Committee passes on for the consideration of the Association the following queries:

(*a*) Should the degree to practise medicine from our Canadian universities fulfil all requirements to practise, without a further licensing examination at the hands of the Councils of the respective provinces?

(*b*) Should we not in Canada endeavour to arrive at a more or less generally accepted idea of what is to constitute proper pre-medical education, and also proper scientific education?

(*c*) Is there a growing tendency to unduly increase the period of attendance in the study of medicine, this now being six and in some centres being mooted as a seven year course? Will such lengthening of the course tend to keep out of the profession, for financial reasons, many men who would otherwise make very successful practitioners?

(*d*) If it is desirable that Council examinations for our own graduates should continue, would it be advisable for the various provinces to unite in such a manner as would do away with provincial Council examinations, making use of the Dominion Medical Council for this purpose?

Your Committee are strongly of the opinion that the Association through this Federal Committee on Legislation should act as a clearing house for the entire Dominion in matters of medical education and legislation. For proper and efficient organization, each province should appoint a representative to this Committee, and be responsible for his attendance at the necessary meetings. These provincial representatives in turn would be Chairmen of their provincial Legislative Committees, thus setting up the necessary lines of communication. By such organization, your central Committee should be kept thoroughly informed as to the exact state of medical legislation in the respective provinces, so that, the full weight and influence of this knowledge could be brought into play in any one particular province, upon call. At the same time, your central Committee could disseminate to each province from time to time, exactly what was being done by the various provinces. Not only would this make for better medical legislation in each province, but it, in time, should bring about such a uniformity of medical legislation as would be in the best interest of the public and practitioners of medicine throughout our country.

Your Committee would most strongly present the point of view that proper medical legislation must be approached from two distinct angles:

(1) By rigidly adhering to all standards which will produce capable practitioners.

(2) By educating the public to a full realization of what constitutes ability and capability to render proper service in health matters.

If these two ideas are ever kept to the front, progress along the desired lines must ensue. Particularly would we stress the advisability of making the public thoroughly conversant along the lines suggested. We believe that the standards of education within the profession are commendably satisfactory.

Your Committee would strongly urge upon the Association that they take the initiative in bringing about a national conference on medical education and legislation. It is suggested that representatives of the Canadian Medical Association, Canadian Medical Council, Provincial Colleges of Physicians and Surgeons, Provincial Medical Associations, Federal Department of Health, Provincial Departments of Health, Medical Faculties of the various universitites, and such other bodies as might possibly be subsequently suggested, get together, say this coming winter, and hold a three day session for the purpose of presenting and discussing the many problems allied to medical education and legislation, which will doubtless suggest themselves to each one of you. Such a conference has already become a permanent annual feature in the United States. Your serious and sympathetic consideration of this recommendation is solicited.

Your Committee would respectfully suggest that the name of this Committee be changed from the "Committee on Federal Legislation" to the "Committee in Charge of the Legislative Bureau of the Canadian Medical Association."

All of which is respectfully submitted.

J. H. MULLIN, *Chairman.*

Moved, seconded, and carried, that the report be received and approved. Dr. Melvin, speaking of the report, stated that much of this is education and not legislation.

Dr. Martin thinks Dr. Mullin's report an excellent one and that we should hear from Dr. Maclean before disposing of Dr. Mullin's report.

REPORT OF THE COMMITTEE ON EDUCATION

The Committee has considered medical education from the standpoint of: (1) Pre-medical standards. (2) Undergraduate training. (3) Post-graduate teaching. (4) Education of the public.

Into the details of the work of medical schools such a report cannot very well enter. These are matters complex and technical. But about the general drift of education and what it is accomplishing, its strong points, and its weaknesses, its right tendencies and wrong tendencies, and its adaption to the needs of students, practitioners, and the people at large, about these things the members of the Association scattered widely throughout the Dominion and representing all circumstances of practice can speak, and upon this they should be heard.

In considering pre-medical standards the question arises as to whether the educational test of a matriculation examination, or even a degree in arts is sufficient guarantee that the candidate is eligible for training for the medical profession.

There is a great difference in what constitutes the pre-medical course. Most of the Canadian universities accept as qualification, the junior matriculation. Their medical course is, therefore, extended to six and even seven years. The University of Manitoba, on the other hand, requires after the junior matriculation, that the candidate take a two year pre-medical course, being practically the first two years of the science course, with Latin as a compulsory subject. Most of the subjects embodied in this pre-medical course, are in other universitites, included in the first two medical years. The subjects considered pre-medical are: chemistry, physics, zoology, botany, Latin and one of the modern languages.

In the case of a candidate with the higher degree, (B.A.,M.A. or B.Sc.) the question as to fitness should be exceptional, provided he has taken the necessary elementary sciences. Until very recently, a graduate in Arts, irrespective of the subjects taken, was admitted without question to the medical college, and allowed one year on his medical course. At present, a graduate in Arts, unless he has taken the requisite science subjects, is not admitted directly into the medical department. For example, a graduate in Philosophy of the University of Manitoba is at the present time reverting back, and taking two pre-medical years. This, added to the five years medical work, will make eleven years of university study before he receives his degree in medicine. Had this student arranged his course so as to include the necessary fundamental sciences, it would have saved him two years.

To encourage a prospective candidate to take three years pre-medical work, it has been suggested that the University grant the degree of B.A. after the completion of his first medical year. At the present time, a combined course is arranged in the University of Manitoba of eight years, (*i.e.*, three pre-medical and five medical) in which a student receives the degrees of B.Sc., M.D. The B.Sc. is conferred at the completion of the first medical year. A somewhat similar arrangement obtains in the University of Toronto, where the candidate receives a B.Sc. in Medicine and a M.B.

It is true, however, that in all schools a few students arrive at their final year who should never have gotten beyond their primary examinations. The University of Minnesota, in addition to educational requirements, and birth within the State, requires that the candidate appear before a board for final admission. It is interesting to note in this connection, that Harvard University has adopted the "wide open door" principle, the only test required being an educational one. The question of an educational test alone is a debatable one, and it is suggested that this committee in reporting further on pre-medical requirements, consider the following points: (1) Physical requirements. (2) Moral standing. (3) Mental efficiency tests.

Under-graduate Training.—The medical student enters the university to acquire a working knowledge of the fundamental medical sciences—anatomy, physiology, biochemistry, and a sufficient knowledge and experience in clinical methods of diagnosis and treatment, in order to fit him for special service to the community. This course requires consideration from two angles, the curriculum and the teacher.

The curriculum is being constantly revised to keep pace with the requirements of the ever changing ideas and ideals of medical thought and knowledge. Dr. E.

Stanley Ryerson, Secretary of the Faculty of Medicine of the University of Toronto, has made a valuable contribution to medical education in his insistence upon an arrangement of the curriculum, correlating the fundamental medical sciences with pathology and clinical teaching.

Under the old system the student, not infrequently when he has reached his graduation exercises seems to have forgotten the essentials of anatomy and physiology, learned in his first two years. Those who have had the experience of passing candidates at their final examination, or at the Dominion Council have observed imperfection in training in clinical methods and diagnosis. At a recent examination, a candidate who knew his theoretical work well, and had read extensively, even quoting from the *Archives of Surgery*, did not seem to know how to proceed in the diagnosis of a case, and could not demonstrate the presence of fluid in a knee joint. It is even possible for students during their course, to spend too much time in the medical library, if they thus exalt theoretical knowledge over practical, and cut down the time for the study of clinical methods, and clinical diagnosis, and their practical application at the bed-side.

The clinical teaching of the student when he enters upon his hospital work is left too much to the senior clinician in charge of the ward. The beginner requires to be taught normal structure and normal function side by side with the abnormal. His powers of observation should be trained, and he should be taught correct methods of examination. Clinical reasoning will thus become stimulated, and he will be able to think with greater accuracy, and arrive at more exact conclusions. This teaching, especially to the student, who is beginning his clinical work can be much better done by the younger men, who are developing along special lines. The method, which obtains in British hospitals, of appointing medical and surgical registrars, who have access to the clinical material, and whose work is a stepping-stone to appointments on the active staff, works out well for both teacher and student.

The purpose of our medical schools is primarily to train general practitioners, and not specialists in any particular line, and this should be borne in mind by the teachers in the different sections.

Considering further the teaching of under-graduates, let us draw two columns, first, "What do we give the student," and second, "What does he need in actual practice?" It will certainly be agreed upon that these columns do not balance, and we do not think they should, but we must not allow ourselves to lose sight of the practical side of medical education. It is the experience of most graduates, who take up rural practices away from the facilities under which they were taught, to find that not an inconsiderable portion of their learning is inapplicable to their new found practice. We cannot blame them, should they feel discouraged and dissatisfied. In short, the country practitioner finds that he is forced to reconstruct a system of medicine all his own. Here is where individual resourcefulness comes, and this is very largely a personal factor.

Post-graduate Teaching.—One of the greatest problems in medical education is that of keeping the man efficient for the highest quality of service after he has said good-bye to his Alma Mater. The average graduate feels that when his degree has been conferred upon him, the interest of the University in his career ceases. A number ofthe provincial associations, particularly the Manitoba Medical Association, and the Ontario Medical Association have done excellent work in bridging over this *hiatus* between the practitioners of the outlying country districts, and the teachers of the larger centres.

Post-graduate courses are now given by the University of Manitoba, and by the University of Toronto. These are first class, but it is not always possible for the man in the country to leave his practice, just at the set time these courses are given. It would be a step forward if the universities would undertake, in addition to their regular post-graduate course, to provide instruction in any subject or subjects, to one or more practitioners at any time during the teaching session.

In the granting of the C.M. degree, the University of Manitoba has taken a very advanced stand. This degree is not conferred until at least three years after graduation in medicine and requires that the candidate devote three years to special study and practical work in surgery. At the end of this time, he is required to pass a special examination in both theoretical and practical surgery. This is the only qualification obtainable in Canada for special post-graduate work. This might well be adopted by other Canadian universities and the principle even extended to other specialties.

Education of the Public.—The time has come when one of the responsibilities of the organized medical profession is the teaching of medical facts to the general public. We all know that diagnosis is more difficult in the early stages than in the later stages of disease, yet our system leaves to a large extent early diagnosis to the untrained, perhaps ignorant, ordinary citizen and brings late diagnosis only to the physician. About most diseases we complain and again complain that they come to us too late. How can we expect them to come earlier since the appreciation of illness by the ignorant and untrained patient has to be very definite before he will think of the extreme step of seeing a doctor? In a way, the doctor is consulted as a court of last resort when the patient and his friends have failed, and very often the doctor begins to exercise his function when the case has been pretty well botched and the disease far advanced.

In some of the provinces it has become the rule that every medical convention shall have one meeting for the public instruction. It would be well for every provincial organization from the Atlantic to the Pacific to adopt this as part of their programme. The American Medical Association after long consideration has brought out a Journal, *Hygeia*, as a medium of instruction for the general public. The Modern Hospital Publishing Company has the *Nation's Health*, a magazine along similar lines. There is much material published by various agencies throughout Canada, that might be made valuable for the instruction of the public in general along the lines of health. The public press could be more utilized than it is, popular lectures should be given at the universities, and broadcasting could be used to great advantage.

Since preventive medicine and the teaching of the public is a definite part of the medical work of to-morrow, why should it not be considered in the training of medical students? This is very different from the training in the way of "selling their goods" given to the student of the irregular cults. But since error can be overcome only by truth, why not help our medical men to wing their words. The Western University has a faculty of public health. The University of Toronto has a medical man lecturing on medical themes to its non-medical students. The University of Minnesota has a department of preventive medicine and public health. Some are afraid of the strain the work of publicity might put upon medical ethics. If the old bottles cannot stand the new wine, then let us have new bottles.

N. J. MacLEAN, *Chairman*

It was moved, seconded and carried that the Report of the Committee on Education be adopted, and that it be referred to the incoming Executive Committee, for the necessary action.

Moved, seconded and carried, that the incoming Executive Committee be empowered to arrange for a medical Conference as outlined, and it is in their opinion expedient so to do.

Invitation for the Meeting of 1924—Dr. Argue, speaking to the invitation from the Ottawa Medico-Chirurgical Society, heartily invites the Association to meet in Ottawa in 1924.

Moved, seconded, and carried, that Dr. J. F. Kidd, of Ottawa, be nominated as President for the year 1923-1924.

MOTOR MARKERS—Moved, seconded, and carried, that the incoming Executive Committee be instructed to study the question of securing motor markers for the profession, of a proper design, and something of a permanent nature.

GROUP INSURANCE—Dr. Mullin, speaking on this question, felt that as medical men we should have lower rates. It was therefore moved, seconded, and carried, that the problem of group insurance of all types be referred to the incoming Executive Committee, to be studied upon and reported next year.

MEMBERS OF COUNCIL—Members of Council who by lot go off the Board at this time, the lots being drawn for by the President: K. A. MacKenzie, of Halifax; J. S. McEachern, of Calgary; J. G. McDougall, of Halifax; W. S. Galbraith, of Lethbridge; A. W. Munro, of Edmonton.

ATTENDANCE OF COUNCIL MEETING—Dr. Mullin stated that some action should be taken to impress upon members of the Council the duty they owe the Association to attend meetings of the Council.

AMENDMENT OF BY-LAWS—Notice of Motion by Dr. Mullin *re* By-laws and Committee Report that clause read "Two months, and that all reports be printed for presentation to Council and the Association."

Dr. Routley gave notice of motion that the Constitution be amended to provide that Chairmen of standing and special committees of the Association become members of the Council.

There being no further business, the meeting adjourned at 6:20 p.m.

SECOND MEETING OF COUNCIL, JUNE 12th, 5 P.M.

With the following members present: Drs. Martin, Ryan, Secord, Argue, Bazin, Reilly, Hamilton, Maclean, McEachern, Stewart, Archibald, Rankin and Routley.

APPOINTMENT OF EXECUTIVE COMMITTEE—The President-elect instructed the Secretary to announce that he had appointed Dr. W. G. Reilly, of Montreal, Chairman of the Executive Committee. In addition to Dr. Reilly, the following six members of Council were duly nominated and appointed to the Executive Committee: F. N. G. Starr, Toronto; E. R. Secord, Brantford; T. G. Hamilton, Winnipeg; J. H. Mullin, Hamilton; J. S. McEachern, Calgary; E. W. Archibald, Montreal.

LISTER MEMORIAL LECTURES—Moved, seconded, and carried.

(1) That the Lister Memorial Lecture be made an institution of the Association.
(2) That the first Lister Memorial Lecture be presented at the annual meeting in Ottawa, in 1924, and that Dr. John Stewart, of Halifax, be asked to give this lecture.
(3) That the Lister Memorial Lecture be given every three years.
(4) That the Executive Committee study the question of ways and means in connection with the expenses pertaining to the giving of the Lister oration, and that further, the Executive Committee consult with the Lister Memorial Committee on this point. (See also p. 690).

ASSIGNMENT OF CHAIRMEN OF COMMITTEES—The following were duly nominated and elected by the Council: *Necrology,* H. B. Small, Ottawa; *Education,* Neil J. Maclean, Winnipeg; *Committee in Charge of Legislative Bureau,* J. H. Mullin, Hamilton; *Constitution and By-laws,* W. G. Rankin, Woodstock, N.B.; *Interprovincial Relations,* Malcolm MacEachern, Ottawa.

It was further decided that Dr. Mullin's Committee should take under advisement the matter of Group Insurance, and also the question of suitable permanent Motor Markers.

There being no further business, the Council adjourned to reconvene again immediately at the close of luncheon on Wednesday, June 13th.

THIRD MEETING OF COUNCIL, JUNE 13, 2.00 P.M.

The President, Dr. Martin was in the Chair. Thirteen members of the Council were present.

REPORT OF INTERPROVINCIAL RELATIONS COMMITTEE—Moved, seconded, and carried, that the report be adopted.

CONDUCT OF BUSINESS—Moved, seconded, and carried, that all business conducted by Council, and all unfinished business of Council requring attention, be passed to the incoming Executive Committee for the necessary action.

INVITING BRITISH MEDICAL ASSOCIATION TO CANADA—After some considerable discussion on this point, in which it was pointed out that twenty-four Manitoba members present had sent a telegram to Winnipeg asking that instructions be forwarded to this meeting permitting the Winnipeg men to urge that the British Medical Association be invited to meet in Winnipeg. It was moved, seconded, and carried, that if Winnipeg decided to have the British Medical Association hold its annual meeting in conjunction with the Canadian Medical Association in that city in 1926 or 1927, that this Council recommend to the Association that such invitation be extended to the British Medical Association on behalf of this Association, and the Medical Association of the city of Winnipeg. (See also p. 690)

There being no further business the meeting adjourned at 2:30 p.m.

SECOND MEETING OF EXECUTIVE COMMITTEE, JUNE 13th, 2.30 P.M.

The Chair was taken by the President-elect, Dr. J. F. Kidd, who, after extending greetings to the members of the Executive Committee, called upon Dr. W. G. Reilly, of Montreal, Chairman-elect of the Executive Committee, to take the Chair.

DATE OF 1924 ANNUAL MEETING—Moved, seconded, and carried, that Drs. Argue and Kidd, of Ottawa, acting in conjunction with their Executive Committee, arrange the dates of the next annual meeting.

REDEMPTION OF BONDS—Moved, seconded, and carried, that the Treasurer be instructed to arrange for the redemption of twenty bonds by lot on the next interest date, which is October 1st, 1923.

MEDICAL CONFERENCE—Moved, seconded, and carried, that the Committee on Education, the Bureau of Legislation, and the Interprovincial Relations Committee, be instructed to study this matter, and to submit their findings and suggestions to the Executive Committee not later than November 1st, 1923.

AFFILIATION WITH BRITISH MEDICAL ASSOCIATION—Moved, seconded, and carried, that the Secretary be instructed to correspond with the Secretary of the British Medical Association regarding a basis of affiliation, and that copies of the correspondence, both written and received, be forwarded to each member of the Executive Committee.

In this connection the following points were noted: That the British Association is apparently in favour of affiliation without any expense to us. We do not wish to lose our identity and would prefer affiliation on a basis similar to that enjoyed by the Canadian Radiological Society and the Canadian Society of Anaesthetists with us.

APPOINTMENT OF LICENSE INSPECTORS—Moved, seconded, and carried, that the Legislative Bureau be instructed to study and report upon this matter not later than November 1st, 1923; and that Dr. Hamilton, of Winnipeg, be requested to place his findings on the matter in writing before the Committee at the earliest possible date.

Canadian Medical Association Journal to CANADIAN MEDICAL MISSIONARIES—Moved, seconded, and carried, that the Secretary be instructed to procure from the Churches in Canada the necessary information as to the number of missionaries which are in foreign fields, and the expense entailed in sending the *Journal* to this number.

THREE GOVERNORS TO AMERICAN COLLEGE OF SURGEONS—After considerable discussion on this subject, both *pro* and *con* it was moved, seconded, and carried that Drs. Van Wart, of Fredericton, Archibald, of Montreal, and F. N. G. Starr, of Toronto, be appointed Governors to the American College of Surgeons.

GROUP COVERING IN THE CANADIAN MEDICAL PROTECTIVE ASSOCIATION—Moved, seconded, and carried, that our Treasurer be instructed to take this matter up with the Canadian Medical Protective Association and be in a position to report back to this Committee not later than November 1st, 1923.

TESTIMONIALS—Moved, seconded, and carried, that the Secretary be instructed to prepare and forward resolutions of appreciation and congratulations from this Association to Drs. Banting, Best, Collip and Macleod for services rendered in connection with the discovery, preparation and application of insulin. Later, the following resolution was sent:

"That the Canadian Medical Association desires to record and express to Drs. Banting, Macleod, Collip and Mr. Best sincere appreciation for the production of insulin; and further desires to urge upon the Federal Government that suitable recognition be granted these gentlemen for the services rendered humanity."

RESOLUTION TO FEDERAL GOVERNMENT—Moved, seconded, and carried, that copies of this resolution embodying the names of the four gentlemen mentioned be sent to the Federal Government urging that these gentlemen be suitably recognized.

TRAVELLING EXPENSES OF EXECUTIVE MEMBERS TO EXECUTIVE MEETINGS—Moved, seconded, and carried, that members of the Executive Committee be instructed to keep account of expenses entailed in attending meetings of the Executive Committee; such memorandum to be placed in the hands of our Treasurer at the time of our next annual meeting.

Lister Memorial Lecture Expense—Moved, seconded, and carried that the Lister Memorial Committee inquire into the matter of expense connected with the preparation and presentation of the Lister Memorial Lecture. This information to be placed in the hands of the Treasurer, not later than November 1st, 1923.

Note.—The Committee unanimously agreed that such communication should go to Dr. Starr, member of the Lister Memorial Committee, Dr. Starr agreeing to obtain the necessary information. (See also p. 688).

Section of Dermatology at Annual Meeting—Moved, seconded, and carried that this communication be referred to Drs. Kidd and Argue, of Ottawa, for their consideration and decision.

Note.—Several members of the Committee present objected to the creation of a number of small sections in the Association as they were heartily in favour of more open general sessions.

It was agreed by the Executive Committee that the next meeting would be at the call of the Chairman sometime after November 1st, 1923. The Secretary urged upon each member of the Executive Committee the advisability of co-operation.

Dr. Starr urged upon the Executive Committee of getting their wives properly informed on items of interest whereby the influence of the wives of the doctors could be properly directed when questions affecting the practice of medicine arose.

There being no further business the meeting adjourned at 3.30 p.m.

THIRD MEETING EXECUTIVE COMMITTEE
JUNE 14TH,

Present Drs. Kidd, Reilly, Bazin, Hamilton, Stewart, Martin. The meeting was called to deal more particularly with the invitation of the medical profession of Winnipeg to the British Medical Association to meet in their city during 1926 or 1927.

The following is a report of the Special Committee Appointed to consider the matter:

"It is unanimously the opinion of the Committee that an invitation should be extended to the British Medical Association to meet in Winnipeg in conjunction with the Canadian Medical Association, and that the Executive shall by correspondence with the British Medical Association decide as to whether the date shall be 1926 or 1927."

It was unanimously agreed that Winnipeg should be allowed to extend the invitation and that further arrangements should be conducted by means of correspondence between the Executive of the Canadian Medical Association and that of the British Medical Association. (See also p. 689).

AUDITOR'S REPORT

Dr. J. W. Scane,
Secretary-Treasurer,
Canadian Medical Association,
Montreal.

Dear Sir:—We beg to report that we have written up and audited the Books and Accounts of the Association for the year ended 31st December, 1922, and attach hereto Balance Sheet as at that date, together with statement of Revenue and Expenditure for the period under review.

The excess of Revenue over Expenditure for the year, after including all known liabilities amounting to $6,736.24, has been transferred to the deficit account, which it reduces to $9,827.27 as shown by the Balance Sheet. We consider it advisable that all Excess Revenue be devoted to the reduction of the Deficit Account until such a time as that account is wiped out. As regards further Excess Revenue, consideration should be given to the question of the redemption of the bonds, which mature in October, 1931.

The Books were in good order, every assistance was given us in carrying out our work and our requirements as Auditors have been fully complied with.

Yours very truly,
McDONALD, CURRIE & CO.,
Montreal, January 10th, 1923 *Auditors.*

CANADIAN MEDICAL ASSOCIATION

Balance Sheet as at December 31st, 1922

ASSETS

Cash on hand	$ 25.00	
Cash in Bank—Current Account	4,769.91	
Cash in Bank—Savings	1,729.64	
		$ 6,524.55
Accounts Receivable:		
Advertising	$ 1,803.22	
Reprints and Illustrations	261.22	
		2,064.44
Investments:		
Ritz-Carlton Hotel 5% Bond		1,000.00
Furniture and Fixtures		25.23
Deficit Account:		
Balance on opening books—1st. January, 1922	$16,563.51	
Deduct—Surplus Revenue for year as per statement of Revenue and Expenditure	6,736.24	
		9,827.27
		$19,441.49

LIABILITIES

Accounts Payable	$1,884.49	
Bond Interest accrued	195.00	
		$ 2,079.49
Prepaid Subscriptions—year 1923		762.00
Bonds—5% Due 1st October, 1931—Authorized $20,000.00		
Issued and Outstanding		15,600.00
Surplus—Special Donation Received (*contra*)		1,000.00
		$19,441.49

CANADIAN MEDICAL ASSOCIATION

Statement of Revenue and Expenditure for Year

Ended 31st December, 1922

By Total Subscriptions—Doctors, Libraries, etc.		$16,684.82	
Advertisements		16,860.02	
Sundry Sales of *Journal*		376.59	
			$33,921.43
To *Journal Expenses:*			
Printing	$15,936.60		
Illustrations	229.03		
Agents' Commissions	1,312.91		
Grant to Editorial Board	750.00		
		$18,228.54	
To *Other Expenses:*			
Bad Debts written off	$ 35.50		
Bond Interest	685.54		
Discount, Exchange and Interest	214.20		
General—Sundries	1,602.36		
Associate Sec'y	429.29		
Postage	387.62		
Salaries	4,923.00		
Stationery and Printing	555.15		
Telephones and Telegrams	123.99		
		$8,956.65	
			$27,185.19
Excess of Revenue for period carried to *Deficit Account* as per Balance Sheet			$6,736.24

The Causes and Prevention of Otologic Conditions Following Swimming and Diving.—Problems incident to swimming and diving, H. Marshall Taylor, Jacksonville, Fla. states, demand the attention of the otorhinologists and public health officials. There should be a hearty co-operation of one group with the other. Prolonged chilling of the body surfaces causes a reduction of temperature and lowers the general and local resistance. The protective mechanism of the nose and its appurtenances against infection is definitely impaired by the destructive action of water.—*Jour. A. M. A.*, Aug. 4, 1923.

Lobar Pneumonia Complicating Induced Pneumothorax.—To two cases of lobar pneumonia involving the uncollapsed lung in the course of a therapeutic pneumothorax, and five cases of broncho-pneumonia, Clough Turrill Burnett, Denver, adds one case. A point of interest is the effect of this intercurrent infection on the bronchiectasis. Prior to the pneumonia, the patient was free from foul sputum as long as the lung was maintained in complete collapse; but if it was allowed to re-expand even slightly, the odor was again apparent. This disappeared again with complete collapse. While the treatment was of necessity discontinued for a time, the long interval being forty-seven days during the pneumonia as compared to an average of two weeks before, it was found that, following the pneumonia, white sputum appeared in increasing amounts immediately following the pneumothorax operations, the foul odor has at no time been noted. The patient has entirely recovered from the recent infection, and is continuing the pneumothorax in the hope of obtaining at least a partial relief from the bronchiectasis.—*Jour. A. M. A.*, July 21, 1923.

Introduction of Coccidioidal Granuloma into Chicago.—The report made by Edwin F. Hirsch, Chicago, besides placing on record another instance of coccidioidal granuloma, concerns the possible permanent introduction of the disease into parts of the country which now are not infested. Judging from reports of this infection in Missouri, Kansas and South Carolina, the disease is either more widespread than has been thought, or it is slowly being carried into places which formerly were free. There may be some peculiar intermediate host or carrier in the natural transmission of the disease which makes human infection relatively infrequent and possible only in the natural habitat of such a carrier or host.—*Jour. A. M. A.*, Aug. 4, 1923.

Abstracts from Current Literature

MEDICINE

Digitalis Therapy Brooks, H., and Donaldson, B., (American Society of Physicians, 1923). *J.A.M.A.* Society Proceedings, June 30th, 1923.

After administration of standardized doses (1 c.c., or 1 cat unit), patients were tested under constant conditions and were observed as to symptoms of toxaemia—vertigo, confusion, nausea and vomiting, and also as to heart rate. An average dose of 1.13 cat units per kilogramme of body weight has been recorded by Eggleston, but we found wide variation of tolerance as estimated by dosage in relation to body weight. In abnormal hearts we found that the blood pressure was decreased and the ventricular rate markedly reduced in auricular fibrillation. In cases of hypertension with moderate nitrogen retention, the rate was decreased on an average eleven points; in more severe cases, four points. In normal hearts, pushing digitalis to the point of nausea had no effect on the heart rate. The first sign of digitalis toxaemia is nausea. The effect of the drug is on the smooth musculature, and atropin does not relieve the symptoms. Our average dosage was 0.26 c.c. per pound of body weight.

In the discussion which followed the reading of this paper, Dr. H. A. Hare, of Philadelphia, said: "I want to protest against carrying the dosage of this drug up to or near the toxic point. I think that the promulgation of this idea will lead to a great deal of error, if it is generally accepted. Many necropsy studies have indicated that there has been excessive digitalis dosage. I think that it will be unsafe in the future to follow the lines of this very sweeping conclusion. In cases of ruptured compensation we may need one or two maximal doses up to the point of nausea and vomiting, but there are hundreds of cases of failing heart in which much smaller doses can be given with excellent result. One difficulty may present itself, and that is that sufficient distinction has not been made between severe ruptured compensation, in which compensation is suddenly broken down and the condition of the patient is grave, and that form of gradual rupture of compensation in which more moderate symptoms are recognized as a manifestation of the condition. In the first case, doses that are approximately toxic can be given. That is practiced by many English physicians. They give large doses until the effect is produced, and then the dose is cut down. In the second type, it is not necessary to give large toxic doses in order to give the heart a rest. Another factor must be borne in mind: Many physicians fail to recognize that digitalis is a distinctly dangerous drug in some abnormal conditions of the circulatory system. When there is partial heart block, the giving of massive doses may complete the heart block. I have seen such a patient moribund from the administration of very massive doses. It has been my practice to give from fifteen to twenty minims of a good tincture to rest the heart over a long period of time. The whole theory of administration of digitalis is the rest and better nutrition of the heart muscle. We cannot rest the heart in twenty-four hours. We have to continue the effect of a massive dose by very many small doses. We put a man to bed to rest his body, and we must also use this idea in resting the heart over a long period of time. Satisfactory results cannot be accomplished in any other way."

Dr. Horatio Wood, of Philadelphia, said: "There is too great a tendency to impress the profession at large with the idea that massive doses must be given in every case, and that each case is not to be handled as an individual entity."

Blood Pressures in Fifteen Thousand University Freshmen. Alvarez, W. C., assisted by Wulzen, R., and Mahoney, L. J. *Arch. Intern. Med.*, July, 1923.

These studies were carried out at the University of California upon 10,000 men and 8,934 women. In the women the average pressure was about 11 millimetres of mercury lower than in the men and were more uniform. For men about sixteen years of age the blood pressure was about 127 on the average and about 118 mm. at the age of thirty; on the other hand, in the women it was about 118 at the age of sixteen years, 111 at twenty-four, and about 117 at forty. These figures reveal the strange fact that the average pressure both for men and women drops off gradually during the first years of adult life.

The author points out that hypertension is common among the younger men, for about forty-five per cent. showed pressures over 130 and twenty-two per cent. gave pressures exceeding 140 millimetres of mercury. Hypertension was not nearly so common in the case of the women; twelve per cent. showing blood pressures above 130 and about two per cent. above 140.

Alvarez concludes that hypertension cannot always be put down to the account of infections or to a strenuous life, apparently it is a peculiarity that is inherited, which in women can be stayed off so long as the ovaries function well.

ARCHIBALD MALLOCH

Influence of Sodium Salicylate in the Arthritis of Rabbits Inoculated with Nonhaemolytic Streptococci. Swift, H. F., and Boots, R. H. *J. Exper. Med.*, April, 1923. Vol. 33, p. 553.

The use of salicylic acid or its derivatives in clinical medicine is not a novelty. These continue to be employed with satisfactory results in a variety of disorders, among which acute rheumatic fever is outstanding in respect to the improvement or relief of patients affected by it. One cannot ascribe such widely recognized results to the passing enthusiasm for some novelty in drug therapy. Substantiated by years of empiric observation, they must have some more worthy explanation. Obviously, the search for the latter is rendered much more difficult so long as the etiology of the disorder is not clearly established. If we adopt the current hypothesis that rheumatic fever is an infection—a sort of "attenuated pyaemia"—it seems logical to think first of all of the possible antiseptic action of salicylic acid in the body fluids, particularly in the inflamed joints where the infection may be localized. In previous issues of *The Journal* it has been pointed out, however, that the conditions existing in the living body preclude the possibility, or at any rate render it extremely improbable, that salicylic acid can accumulate in bactericidal quantities in the tissues during life. The antipyretic potency of the salicylates does not account for their beneficial effect in rheumatic arthritis, since other potent antipyretics are not equally efficient; and a similar argument of comparison applies to the doctrine of the analgesic virtues of salicylic acid derivatives. Morphine, for example, does not relieve the redness, heat and swelling of inflamed joints. In an attempt to imitate rheumatic arthritis experimentally in animals, Swift and Boots of the Hospital of the Rockefeller Institute, have noted that rabbits inoculated intravenously with nonhaemolytic streptococci, while under the influence of full therapeutic doses of sodium salicylate, developed almost as many inflamed joints as the untreated controls similarly inoculated. The salicylated rabbits, on the other hand, had a much higher proportion of mildly inflamed joints than did the controls. This anti-inflammatory action was most evident in the animals inoculated with streptococci of the lowest virulence, and could not be demonstrated in animals inoculated with haemolytic streptococci. Thus, we stand before the experimentally demonstrated fact that salicylates may modify favourably certain types of inflammation of the joints, while the explanation of this fortunately beneficent result still remains to be ascertained.—(*Jour. A.M.A.*).

Pneumonia. Wadsworth, A. (Symposium on Serum Therapy, The Medical Society of the State of New York, 1923). *J.A.M.A. Society Proceedings*, June 30th, 1923.

The work done in New York State in the development of serum therapy in pneumonia was started in 1915, when centres for distribution of Type I antipneumococcus serum were established. This distribution is now more general. The serum has always been of the highest potency, according to the methods developed by Cole. The results from the civil population and from the army camps have been studied. The reduction in mortality is not convincing, although the statistics have been influenced by many factors, such as the difficulty of getting control cases, difficulty of getting standardized serum, and delay in treatment until an unfavourable prognosis could be expected. A study of the pneumonic process in man shows that the pneumococci develop in a partially immunized host, and that immunity is preserved by immune serum, although the pneumococci may survive for several days after immunization of the serum. Cases studied at the Rockefeller Institute were recorded under optimal conditions, and the mortality of 1.5 per cent. in 107 cases was very favourable. We have not been able to obtain such standardized serum, nor is serum labelled according to its potency, so that protective results are only approximate. The results reported from various localities and groups give contradictory results. In cases in which the serum is standardized and given early, the treated cases show greatly lessened mortality. In cases in which there is delay in treatment and perhaps serum of low potency, the results are poor. There is no evidence that the serum is harmful unless the technique of administration is careless. The proper dose is from 50 to 100 c.c., four or five times. If Type I antiserum is given, promptly, carefully and regularly, it is of definite value in the treatment of Type I pneumonia.

Discussion.—Dr. Rufus I. Cole, New York: "Statistics in regard to antipneumococcus serum are very bewildering. There is difference in different hospitals, in different wards in the same hospital and difference from season to season. Personal observations seem to have more merit than statistical study. We have treated 241 cases of Type I pneumonia, with twenty-four deaths, a mortality of ten per cent., approximately. These were divided into cases in which serum might have been effective; and cases in which no serum treatment would have availed. I have never known of recovery to occur in pneumococcus meningitis, with or without serum. The other class of cases was due to too late, or poorly administered serum treatment. In this class, mortality might have been slightly reduced. In other cases, serum was given early and intensively, until the patient either died or recovered. The best guide to efficacy of the serum is the positive or negative blood culture. Pneumonia is a focal infection, likely to become generalized. Effective serum treatment eliminates bacteremia. If bacteremia persists, it is accompanied by endocarditis or meningitis, so that we do save lives even if not a considerable number. Serum treatment is more difficult for the private practitioner, on account of delay in early diagnosis, but with the aid of the state board of health I think the difficulties are not insurmountable."

Results of Administering Iodine to Patients Having Exophthalmic Goitre. Plummer, H. S., (American Society of Physicians, 1923). *J.A.M.A. Society Proceedings*, June 30th, 1923.

It has been taught that iodine should not be administered to patients with exophthalmic goitre, on the ground that it causes hyperfunction. There are two entities included in the term hyperthyroidism: first, exophthalmic goitre, second, hyperfunctioning adenomatous goitre. In the latter, the basal metabolism is more nearly normal. In exophthalmic goitre there are certain symptoms: (1) nervous phenomena, (2) eye symptoms. The first include purposeful but useless movements. The higher psychic processes are chaotic. The patients cannot explain why they cry or laugh. In the vegetative nervous sytem there is the same process of imbalance. These signs have given rise to such terms as "sympathotonic" or "vagotonic" goitre. These symptoms seem to be due to underlying metabolic disturbances. Often, after slight operations, the temperature rises and death occurs in a few hours. We judge the differential diagnosis by the nervous phenomena, which, if excessive, point to a great surgical risk. The eye phenomena are two: the exophthalmos, or protrusion of the eyeball, and the stare which fluctuates with the nervous phenomena. Anything that will overstimulate the thyroid can give the clinical picture of exophthalmic goitre. In such cases, the normal hormone, thyroxin, is not completely iodized. This incompletely built up thyroxin, as it leaves the gland, can enter into catabolic reaction faster than the normal, stable molecule and raise the metabolic rate more rapidly. If, therefore, we can change the character of the molecule, we can change the basal metabolism. If there is intense metabolic distress for lack of iodine, death occurs from lack of iodine. From this it follows that if we can change the production of abnormal substance to properly iodized substance we can cut down postoperative mortality, avoid crises, and change the picture of the nervous phenomena. Acting on this plan, we administered ten drops of compound solution of iodine for ten days following operation, with the result that we have found there is no such thing as postoperative deaths from hyperthyroidism if this dosage has been administered to the patient with regularity. In other words, the patient is relatively short of iodine, and dies from lack of it. When we replace the iodine, we do away with postoperative deaths.

Poliomyelitis—Epidemic Encephalitis—Bacillary Dysentery. Flexner, S., (Discussion on Serum Therapy, The Medical Society of the State of New York, 1923). *J.A.M.A. Society Proceedings*, June 30th, 1923.

Poliomyelitis and encephalitis are two distinct diseases. They differ as much as measles and scarlet fever differ. Poliomyelitis is a disease which appears sporadically, and lately has appeared epidemically. It is more frequent in children. It is successfully transmitted to monkeys and the value of serum tested out. There is no such thing as artificially produced serum against poliomyelitis, although we have a filtrable virus from the nervous system of patients. We cannot use this material, however, to immunize large animals, such as the horse, in order to get serum. On the other hand, in a recovered case, in monkey or man, there is for many months in the veins an antiserum which neutralizes the virus of poliomyelitis. Curative serum, therefore, exists. Monkey serum cannot be used for man. The animals are too small and too prone to other diseases to utilize their serum. Some measure of success has been attained in using serum of recovered humans in the treatment of other persons. During an epidemic people are, perhaps, more generous in this respect, and diagnoses are made more readily, but the method must be applied early because such widespread damage occurs to the nervous system that restoration is impossible. Fatality may be avoided, however, even if crippling cannot be prevented. Death follows involvement of the medulla with paralysis of the respiratory centres. The serum is given intraspinally, not intravenously.

Encephalitis is a disease which has appeared in a pandemic form during the past three or four years. There have been descriptions of the disease and of outbreaks before, but not in pandemic form. One explanation of this is that it is concomitant with influenza. There is some relationship to influenza. On the other hand, some workers think it is an independent disease but coincident chronologically. Hitherto the disease has not been so prominent as to make a great impression on the medical profession and laity, so that if you consider it as part of influenza, you must prove your thesis, whereas if you consider it as an independent disease, the approach to study is more effective. We cannot be sure that we have communicated it to animals, although we may have transmitted it to the rabbit. The monkey is not susceptible. The micro-organism which causes it is unknown. I think the solution of this disease is still in the future, for although every effort has been made, so far we have not been able to reach any definite conclusions, as we have with poliomyelitis.

Meningitides. Ayer, J. B., (Symposium on Serum Therapy, The Medical Society of the State of New York, 1923). *J.A.M.A. Society Proceedings*, June 30th, 1923.

In the last ten years there has been no great advance in the treatment of meningitis in any form. For meningococcus meningitis we have no efficient serum; but, if we had, the end of a long channel seems a somewhat illogical approach from which to treat a general disease. There are various conceptions as to the origin and distribution of infection in meningitis. One is that the fluid originates in the choroid spaces of the lateral ventricles, and flows thence downward into the fourth ventricle and into the cisterna magna, upward over the convexities and over the arachnoid spaces. Meningitis is almost always a primary cerebral process; very rarely does the process start near the cord. Later there is a generalized cerebrospinal meningitis. As early as the second or third day there is blocking in the pathways by formation of exudate which obstructs any form of treatment given intraspinally. There may be blocking at one or two points. These facts demand that we seek some method of treating meningitis other than the lumbar route. In three days the canal is full of exudate and fibrin, and the infection has extended to the pia, the crus and the ventricles. There are also small abscesses from infection of the perivascular spaces. Ventriculitis also occurs in man as early as the fourth day. These conditions offer tremendous obstacles to treatment, and it is a wonder that serum ever reaches the brain at all. The fluid passes from the ventricles downward to the cisterna magna, from thence outward, upward and forward into a smaller cistern at the base of the chiasm and to the pons. In 1908, Cushing put a needle into the ventricle and introduced serum. The patient died, but lives were saved later by this procedure. I have lately used a method of puncture of the cisterna magna in 350 patients, without accident, at the Massachusetts General Hospital. My method offers three routes of choice, giving opportunity for irrigation. The ventricle can be approached by the cortex or by puncture of the corpus callosum. The method of approach hitherto has been miles away from the site of infection, and the pathways have early become blocked, making remedial measures impossible because they did not reach the trouble. These cases must be treated early and as near the process as possible. We have a choice of routes by which we can drain and introduce the serum, and we can irrigate efficiently by double or treble punctures, if necessary. If desired, we can reduce the volume of the ventricles by introducing a thirty per cent. hypertonic salt solution.

Discussion.—Dr. W. W. Herrick, New York:

"Our conception of meningitis infections has been too narrow. Clinical studies under the right conditions have shown that the disease is primarily a systemic infection with metastases into the meninges or elsewhere. Not only are the meninges involved but also the encephalon. Foci are present throughout the brain as a whole. In the treatment of meningococcus infections in general, if one can make a diagnosis early, I think intravenous treatment, supplemented by intraspinal treatment, is sufficient; but mechanical accidents in these cases are so common that the methods of meeting them are valuable. There are two phenomena: early blocking and late blocking. Early blocking is tragic, and due to inflammatory swelling of the encephalon, causing sudden death in the first twenty-four hours. Necropsy shows wedging of the brain substance down into the foramen magnum. I think the way to meet this situation is by injecting thirty per cent. hypertonic salt solution intravenously, or by injecting fifty per cent. saline sulphate of magnesium by rectum. There are two types. Most often there is involvement of the foramina of Luschka and of Magendie. I have seen one case in the aqueduct of Sylvius, and one case of cord blocking. There is one point of interest which is useful. Before undertaking ventricular puncture or cisterna magna puncture, the lumbar puncture needle can be placed in the foramen and manipulated vigorously (under anaesthesia), and if there is an accumulation blocking the foramina, the tissue that roofs over the floor of the fourth ventricle may be moved and cause breaking through of the tenuous subarachnoid adhesions. If this is unsuccessful, we can do a puncture of the cisterna magna, and lastly puncture of the ventricles. Cistern puncture is free from danger. In one case there was haemorrhage from the plexus of veins found in that region into the fourth ventricle. Whether that caused death, I do not know. Dr. Ayer's method is useful in handling the mechanical accidents that so frequently occur in this infection.

Research in Epilepsy. (Editorial, *J.A.M.A.*, June 30th, 1923).

In spite of extensive clinical and experimental study, epilepsy still remains an unsolved problem. Only within comparatively recent times has it been realized that it is a symptom-complex that may be elicited by many causes, and is not a disease *sui generis*. Even the site of the nervous discharge that is responsible for the convulsions has not been established, and the mechanism of the discharge has been variously ascribed to defective neuron construction, the action of toxins, vasomotor disturbances, and finally to purely psychogenic factors. In the April, May, and June issues of the *Archives of Neurology and Psychiatry* is a noteworthy series of articles reviewing previous work and reporting the results of clinical, ecologic and experimental investigations that show real progress in this baffling problem.

The resemblance between the tonic spasm of the early stage of an epileptic convulsion and the extensor rigidity of the decerebrate animal has been noted by various observers; the clonic spasms, on the other hand, have seemed to correspond with the effects of stimulating the cerebral cortex. Using injections of picrotoxin to excite convulsions, Pollock has demonstrated, in cats and dogs, that both tonic and clonic phases, indistinguishable from those in the intact animals, occur in animals that have been decerebrated by section of the brain stem below the optic thalami. Even after section below the level of the seventh nerve nuclei, similar fits are sometimes evoked, though they are less severe, and a larger dose of picrotoxin is required.

These observations, if confirmed, establish that the cerebral cortex is not necessary for the evocation of a typical fit. From clinical and experimental study, Rosett propounds a highly suggestive and fundamental conception of the epileptic seizure. He points out that typical tonic spasm, and even at times clonic twitchings, can be observed in the every-day reactions of normal people to sudden and unexpected shocks, and that these reactions are influenced, in a manner identical with that shown by the seizures of epilepsy, by the administration of bromides, phenobarbital and caffein. He also calls attention to the fact that the one constant feature of the epileptic seizure is loss of consciousness, a fact which suggests that ablation of cerebral function is essential. He concludes that the epileptic fit is a discharge of midbrain centres when released from the control of the cerebral cortex, and is not a cortical discharge. This concept of "normal epileptoid reactions" accords well with many otherwise inexplicable facts and agrees with Pollock's findings just described.

Elsberg and Stookey studied convulsions produced by injections of absinth. Among results of their preliminary work, they find that, in cats and dogs, susceptibility to convulsions is increased by thyroidectomy and is not diminished by starvation. Even more striking is the conclusion that susceptibility is not exaggerated by diminishing the alkalinity of the blood by the direct injection of lactic acid. This observation appears directly to contradict widely accepted views on the *rôle* of acidosis in the mechanism of epilepsy. Acidosis is the cornerstone of the theory built up by Cuneo from his remarkable clinical and chemical studies. Cuneo's work, which is appreciatively reviewed by Osnato, leads him to conclude that, contrary to general belief, the acidosis which he conceives as liberating the toxic proteose is due to faulty digestion of starches from deficiency of the alkalization function of the intestinal mucosa and liver, with the consequence that salts of organic acids are set free in the circulation. He found that convulsions were more numerous and severe on a diet rich in starches than on a meat diet, and also that administration of sodium acetate or tartrate to epileptics resulted in such severe fits that the experiment had to be discontinued. These observations, as yet unconfirmed, open fresh leads which promise results for the future, of importance not only for the interpretation and eventual rational treatment of epilepsy, but also for the elucidation of some obscure phases of metabolism in uremia and other disorders accompanied by convulsions.

DERMATOLOGY

Resin Dermatitis. Report of a Case. Beinhauer, L. G., M.D., Pittsburgh. *J.A.M.A.*, July 7th, 1923.

The writer points out that occupational dermatoses are gaining increasing attention in direct proportion to the increase of Workmen's Compensation Acts, and the interest of employers in the causative factors of these diseases.

This is an interesting report of a violinist with recurring eruption of over five years duration. Especially during the last two years, the patient noticed a dry brittleness of the fingers and nails, with a fine, discrete, pin-head sized vesicular eruption extending from the web to the tip of the fingers. There was also a dry pruritic scaly eruption about the nose.

The violinist played in a theatre orchestra from September to April. The eruption disappeared in the summer. The fingers involved were the second and third on the left hand, prominent in violinists' technique. As a test, the resin was applied to the whole hand and dermatitis followed. Dermatitis factitia was ruled out and negative tests were made for proteins and ringworm.

Skin tests were positive to dark resin and negative to the white and red varieties. A cure was effected when white or red resin was applied to the bow and the dark resin eliminated.

C. R. Bourne

Treatment of Ringworm. Whitfield, A. *The Lancet*, June 2nd, 1923.

This subject is dealt with under four headings:

(1) Ringworm of the hairy regions. Complete epilation is necessary as no treatment penetrates the hair completely. Methods mentioned are X-rays and croton oil treatment. Both have the risk of permanent baldness, but, in expert hands the danger of the former is lessened. The latter is painful and leads to pustulation. To protect the healthy hair Whitfield's "Guard ointment" is used: ac. benz. gr. xxv; ac. salicyl. gr. xv; lanolin, soft paraffin ad. oz. i. Isolation is necessary while the hairs are falling.

Another method is: Equal parts of sodium chloride and vaseline, rubbed in once daily, after bathing the head in hot water (painful but not so dangerous).

Whitfield's ointment for depilatory is usually efficacious, i.e., ac. benz. dr. i; acid. salicyl. dr. ss; lanolin dr. iv; soft paraffin ad. oz. i rubbed in thrice daily.

(2) Nails.—Under a general anaesthetic all diseased nail to be removed. Dress with ac. salicyl grs. xx. ung-chrysarobin ad. oz. i daily for four weeks.

(3) Glabrous skin of body and limbs offers little difficulty. Paint with equal parts of tr. iodi., and liq. iodi. fort.

(4) Dhobi Itch of hands and feet.—This form is obstinate owing to the thickness of the skin. Permanent cure usually results from the following treatment: After the morning bath trim all vesicles and horny flaps. Rub areas with swab and sol. chrysarobin, ten per cent. in equal parts acetone and methylated spirits. Use cheap cotton socks. Wash in evening and apply ointment of five per cent. benzoic and three per cent. salicylic acids. Continue for four weeks unless redness supervenes, in which case the ointment only is used.

C. R. Bourne

News Items

GENERAL NEWS

WINDWARD ISLAND MEDICAL SERVICE

Word having been received from the British Medical Association that conditions under which medical officers are working in the Windward Island Service are very unsatisfactory, particular reference having been made to inadequate remuneration, physicians throughout Canada are advised to refuse acceptance of appointments in the Windward Islands until such time as the existing grievances are righted. Further particulars on this matter will be gladly supplied by the General Secretary of the Canadian Medical Association.

According to arrangements which are absolutely unique in the history of the Canadian Medical Association, Dr. F. J. Tees, of Montreal, lecturer in Clinical Surgery at McGill University, Dr. F. W. Marlow, Associate Professor of Gynaecology, University of Toronto, and Dr. T. C. Routley, the newly elected General Secretary of the Canadian Medical Association, met in Victoria, B.C., on July 3rd, to address the Victoria Medical Society. The group then proceeded to Vancouver, visiting the cities of the West in the following order: Vancouver, July 4th and 5th; Calgary, July 9th and 10th; Edmonton, July 11th; Saskatoon, July 12th; Regina, July 14th; Winnipeg, July 15th and 10th; and Port Arthur, July 17th. Dr. Tees spoke on "Fractures"; Dr. Marlow, "Symptomatology of Pelvic Diseases"; while Dr. Routley spoke on "The Aims and Objects of the C.M.A." In addition to this, Dr. Marlow took the opportunity in the various cities of discussing with the men the *pros* and *cons* of the formation of a Canadian College of Physicians and Surgeons. From the point of view of attendance at the meetings, enthusiasm, cordiality, harmony, and a most generally expressed desire in all parts of the West for the furtherance of all efforts which might be calculated to build up a strong national organization of the profession, it was very evident that the Association has a very important and useful part to play in the lives of the practitioners of medicine in Canada. A few points might just here be stressed: Each of the provinces visited has important provincial problems which the provincial Associations are endeavouring to work out to the best advantage in their own way. Some important questions, like a common factor, appear to be in all the provinces. At the present time, machinery is as yet undeveloped which keeps any one province thoroughly conversant and informed on the problems of their *confrères* in the other provinces. The Canadian Medical Association has a great work before it, particularly in the field of acting as a clearing house for the nine provincial units. If the Canadian Medical Association shows service, a large membership is guaranteed. While this is the first tour of the kind ever conducted by the Association, it is fully believed that the purpose in mind was very well served in that a personal contact was set up which should be productive of better relations in the future. The sincere thanks of the Canadian Medical Association are due to Drs. Tees and Marlow who not only gave their time to make this trip, but also defrayed their own expenses.

CHEMIST-PHARMACOLOGIST WANTED AT OTTAWA

The Secretary of the Civil Service Commission has asked if we would bring to the notice of the readers of the *Journal* that a chemist-pharmacologist is to be appointed for the Division of Medical Research in the Department of Health at Ottawa. The initial salary is $3,480 per annum which will be increased upon recommendation of efficient service at the rate of $180 per annum, until a maximum of $4,020 per annum has been reached. The candidates must be graduates in science or medicine from a university of recognized standing with specialization in pharmacological chemistry and at least two years' post-graduate study in pharmacological work or equivalent post-graduate teaching experience. He must be able to carry on independent research and must be able to read French and German fluently. He will be required to perform *biological* and chemical essays of pharmacopoeial and pharmaceutical preparations and of refined and crude drugs, etc. If in other ways eligible preference is given to those who have seen active service overseas or on the high seas.

For this particular competition (No. 5922) applications must be filed in the office not later than September 27th. Forms may be obtained from the offices of the Employment Service of Canada, from Postmasters at Prince Rupert, Vancouver, Victoria, Edmonton, Calgary, Regina, Winnipeg, Quebec, Charlottetown, Halifax, Fredericton and St. John, or from the Secretary of the Civil Service Commission.

The annual assembly of the Tri-State District Medical Association will be held at Des Moines, Iowa, from October 29 to November 1, inclusive. The Association is purely a post-graduate organization and meets for scientific study. All members in good standing of Canadian provincial associations are invited to attend and to take part in the programme. Many well known American physicians and surgeons are on the programme committee. The Association headquarters will be at the Fort Des Moines Hotel.

NOVA SCOTIA

A plan is on foot to erect a hospital at Inverness.

Dr. Fraser Harris, Professor of Physiology at Dalhousie, is summering in England.

Dr. H. R. Corbett, a recent graduate of Dalhousie, has been appointed to the Staff of the Nova Scotia Sanatorium.

The seventieth annual meeting of the Medical Society of Nova Scotia was held at Windsor on the third and fourth of July, under the presidency of Dr. Ross Millar, of Amherst, and was of exceptional interest. The attendance was unusually large, and, in addition to a full programme of addresses, papers and demonstrations, much business of importance was disposed of. The addresses in medicine and surgery, given by Dr. Gordon, of Montreal, and Dr. Cheever, of Boston, were greatly enjoyed. Dr. J. W. S. McCullough, of Toronto, who was to have given the address in public health, was unfortunately unable to attend. The Society meets next year at Amherst. Dr. O. B. Keddy, of Windsor, is the new president.

The Association of Medical Health Officers of Nova Scotia met in annual session at Windsor the day preceding the meeting of the Medical Society. A good attendance and an excellent programme combined to make the meeting very successful. Dr. G. C. W. Bliss, of Amherst, was succeeded in the presidency by Dr. C. S. Marshall, of Bridgewater. Dr. A. C. Jost, Provincial Health Officer, was elected secretary. A feature of the meeting was a very able address by a veteran physician, Dr. J. B. Black, of Windsor, who, while a member of the Dominion House of Commons, made the initial move which ultimately resulted in the establishment of the Federal Department of Health.

Dr. B. Franklin Royer has resigned his position as executive officer of the Massachusetts-Halifax Health Commission, and has returned to his native state (Pennsylvania). Before leaving Halifax, he participated in a very interesting event, in which Miss Jessie Ross, the chief nurse of the Commission, became Mrs. Royer. Both Dr. and Mrs. Royer are well known to those who specialize in public health, and their unusual qualifications for directing public health activities, their intense interest in, and tireless devotion to, their work, and the readiness with which they responded to every request for assistance, gained for them many friends and admirers in Halifax and in fact throughout Nova Scotia. Dr. Royer plans to spend several months in travel before resuming work in the public health field. Dr. T. M. Silnilwicz, the tuberculosis examiner for the Commission, has been placed in charge of the executive work pending the appointment of a successor to Dr. Royer.

The bulletin of the Medical Societies of Nova Scotia, for July, 1923, gives the details of the medical societies of the province. Full reports of recent medical society meetings are given, including that of the Canadian Medical Association, and of the Medical Health Officers' Association, meeting in Windsor on July 3rd. The bulletin is in attractive form and contains in its pages much that should be of interest to the Nova Scotian profession.

QUEBEC

Dr. W. W. Chipman has left for a two months' trip to England and Scotland.

Dr. E. W. Archibald has gone to Europe and expects to return in September.

Dr. J. B. McConnell was the recipient of an illuminated address and a travelling handbag from a number of his *confrères* and some of his first patients, as a mark of esteem and to commemorate his fiftieth mile stone in the practice of medicine.

Dr. S. Grondin has been appointed to be official mentor in Paris of the many students from Quebec who are studying in the French capital. Dr. Grondin knows Paris well having studied there on different occasions. He will not only look after the welfare of these students, but will be in a position at the same time to assure them the most advantageous and profitable means of perfecting themselves in their studies.

Nearly one-third of the children attending schools bear latent tuberculosis in their bodies, declares Dr. Corsin, D.P.H., District Health Inspector, writing in the *Sanitary Bulletin*, published by the Provincial Health Department. These children need to be protected against the germs that "slumber in their lungs and glands." Further, the children are constantly exposed to contagion in school, from each other and also from the teacher. As other causes of tuberculosis in schools are cited, absence of disinfection in class rooms, etc., bad heating, dry sweeping, insufficient ventilation, unsatisfactory toilet accommodation, common use of drinking utensils, pencils, slates, etc. In addition to remedying these defects, Dr. Corsin recommends restraining the efforts of the over-ambitious scholar, whose struggles for a high place in his class frequently leave him physically weakened and an easy victim for disease. Work should be regulated in such a way as not to take the place of recreation, relaxation and physical exercise for the normal development of the body.

At a meeting of the Board of Governors of McGill University in July last, leave of absence for one year was granted to Dr. Maude E. Abbott, curator, and E. L. Judah, osteologist and preparator, of the McGill Medical Museum. Dr. Maude E. Abbott goes to the chair of pathology and bacteriology in the Women's Medical College of Pennsylvania, Philadelphia, where, as professor of these united subjects she will be given assistance and ample scope in the development of medical research and the co-relation of clinical and bacteriological teaching. Mr. Judah, who has filled the post of preparator in the McGill Museum for some twenty-seven years, and began work there as a pupil of the late M. Jules Baillie, a distinguished technician and a member of the French Academy, goes to the Mayo Clinic of Rochester, Minn., where he will be given every facility in the development and construction of a great museum. It is the intention of both Dr. Abbott and Mr. Judah to return to McGill after the year has elapsed, Mr. Judah to assist in the development of the museum of the new Pathological Institute, and Dr. Abbott to complete the scientific catalogues of both McGill Medical and the Canadian Army Medical Museum, of which she is managing editor.

The Community of the Sisters of Providence has bought the Lapierre farm at Cartierville as a site for a large hospital for incurables, and a sanitarium for tuberculous patients which will be erected. The tract of land, six acres in width by about twenty-three in length, offers every advantage desirable for the erection of the proposed fire-proof hospital. It will contain 800 beds, 400 for the tuberculous, and 400 for the incurable cases. The architects, Viau & Venne of Montreal, have charge of the construction. The members of the Board of Health and many physicians who make the treatment of tuberculosis a specialty, have been consulted and all unanimously approve of the site of the future hospital. The Community of the Sisters of Providence intend to instal every modern convenience, and make the institution thoroughly up-to-date in every respect.

Dr. W. G. Reilly was appointed president of the Province of Quebec Medical Association at the annual meeting held here; *Vice-presidents*, Dr. P. Z. Rheaume, Montreal; Dr. W. W. Chipman, Montreal, and Dr. Daignault Quebec; *Joint secretaries* Dr. J. U. Gariepy and Dr. D. Grant Campbell.

Dr. Louis-Francois Badeaux sailed from Quebec on the *S.S. Antonia* for France where he will spend a year in special studies in Paris. A district meeting of the medical societies of Arthabaska and Three Rivers is being held at Victoriaville. Among the principal speakers Dr. Normand will address the meeting on "Abdominal Surgery" and Dr. Omer Desjardins city health officer will also read a paper.

Dr. Carlyle Porteous has recently been appointed superintendent of the Protestant Hospital for the Insane. Verdun, in succession to Dr. T. W. Burgess.

The merging of the Montreal Maternity Hospital with the Royal Victoria Hospital and the proposed erection in the grounds of the Royal Victoria Hospital of the new Royal Victoria Montreal Maternity Pavilion will greatly increase the hospital teaching facilities for McGill University. The Royal Victoria Montreal Maternity Pavilion and receiving stations under its ægis will be the centre of teaching in maternity work for medical students at McGill. There will probably be receiving stations in various parts of the city but it is too early yet for any definite plans to have been formulated. In constituting a great teaching centre for McGill University the Royal Victoria Montreal Maternity Pavilion will be continuing the work of the Montreal Maternity Hospital. The Montreal Maternity Hospital has always been a McGill institution as it were. The University, however, did not contribute anything towards its support and had nothing to do with its administration but the head of the department of obstetrics and gynaecology has always been the medical director of the hospital and the university nominated the medical staff, the board of management of the hospital confirming the appointments.

Montreal's unique record of absolute freedom from smallpox in over eighteen months is one in which Dr. S. Boucher, director of public health, is taking great pride. There has not been a single case reported to the authorities for nearly two years and the chairman of the board of health attributes this to the fact that vaccination is general, at least among school children. Present regulations bar any child from attending school who has not been vaccinated within the prescribed time and for the convenience of the public and to save additional expense for the parents the city has maintained for some time free vaccination stations at convenient parts of the city. Slight modifications have been made in the list issued last week on the location and opening time of these and a corrected schedule has been prepared.

Dr. C. F. Martin was appointed Dean of the Faculty of Medicine, McGill University, at a meeting of the Board of Governors of the University, succeeding Dr. George E. Armstrong, who held the office. The *Journal* extends its congratulations to Dr. Martin.

A series of free courses on the use of insulin in diabetes will be given by Dr. E. H. Mason, Director of the Metabolism Clinic in the Royal Victoria Hospital, under the auspices of the Rockefeller Fund. The first course will be held on August 27th and 28th in periods of four hours on each day. Subsequent courses will be given at fortnightly intervals, September 10th and 11th and September 24th and 25th. To ensure personal attention each class will be limited to twenty physicians. The course will include: (1) Description of the development of the discovery of insulin; (2) Its action in the body. Hypoglycaemia; (3) Details of insulin treatment; (4) Calculation and preparation of diets and food stuffs; (5) Methods of controlling insulin administration; (6) Special topics—surgical and other complications. If the number of physicians applying to take the courses cannot be dealt with on the dates given above, further periods of instruction at a later date are contemplated.

The appointment of Dr. Edward Archibald to be Professor of Surgery and Chairman of the Surgical department in the Faculty of Medicine of McGill University has been received in the University and by the teaching staff of the Medical Faculty with enthusiastic approval. The appointment will be equally popular throughout the medical world, and especially so in Canada and the United States where he is widely known for his interest in and his contributions to the scientific aspects of surgery, and for his application of the knowledge gained in the experimental laboratory to the practice of surgery.

His experimental and clinical publications on pancreatitis are quoted wherever this subject is discussed. His contributions to neurological surgery in civil and military practice are numerous. His more recent papers and addresses on the treatment by surgery of certain types of pulmonary tuberculosis have caused widespread interest, and his teaching on this difficult subject is being rapidly accepted and followed.

Dr. Archibald is a graduate of McGill in Arts and Medicine. He was a resident surgeon in the Royal Victoria Hospital under Dr. James Bell. After a period of study in France and Germany he returned to the Hospital as surgeon, in charge of a service. This position he has filled since 1904. He is a member of the Interurban Surgical Society of America, of the Clinical Surgeons of America, of the Neurological Society, of the Association of Thoracic Surgeons, of the Tuberculosis Society, and is on the Board of Governors of the American College of Surgeons.

ONTARIO

COUNTY SOCIETY MEETINGS

On July 11th, the Lambton County Medical Society met at Sarnia, and an address was given by Dr. F. A. Cleland, of Toronto, on "Diagnosis and treatment of acute abdominal pelvic conditions."

A meeting of the Hastings County Medical Society was held at Madoc, July 11th. The Society was addressed by Dr. G. S. Young, of Toronto, on "Psychotherapy from the standpoint of the general practitioner."

On July 18th, a union meeting of the Oxford and Perth Medical Societies was held at Lakeside, addresses being given by Dr. Norman Gwyn on "Postoperative pulmonary complications"; and by Dr. A. J. Grant, of London, on "Local anaesthesia, its uses and limitations."

The York County Medical Society met at Mount Albert, on July 18th. Dr. R. P. Smith, of Hamilton, discussed "Problems of infant feeding."

The Peel County Medical Society held a well attended meeting on July 19th, in Brampton. The following very interesting and instructive addresses were given: "Diagnosis and treatment of acute pelvic conditions," by Dr. F. A. Cleland"; "The uses of radium in general practice," by Dr. Arnold Clarkson; "The relationship between the medical officer of health and the general practitioner," by Dr. D. A. McClenahan.

July 26th.—Dr. Charles Macklin, London; Subject: "Recent studies on the structure of the lung." Dr. Anderson, Director of Laboratories; Subject: "The value of a public health laboratory to the general practitioner." August 2nd.—Dr. W. L. Robinson, Toronto; Subject: "Classification, pathology, diagnosis and treatment of diseases of the thyroid." Dr. R. D. Rudolph, Toronto; Subject: "The uses of cardiac stimulants in the care of the sick." Dr. George Ewart Wilson, Toronto; Subject: "Intestinal obstruction."

August 9th.—Dr. G. S. Young, Toronto; Subject: "A discussion of the value of physical signs in the examination of a patient." Dr. C. S. Wright, Toronto; Subject: "Back pain, with special reference to sacro-lumbar and sacroiliac and their relation to compensation," with illustrations with lantern slides. Dr. N. A. Powell, Toronto; Subject: "Collies fractures."

On July 25th, Dr. G. McLarty, of Toronto, addressed the Huron County Medical Society, at Bayfield, on "Diagnosis and treatment of the psycho-neurosis."

Dr. H. B. Anderson addressed the Ontario County Medical Society, on August 2nd, on "Pituitary disease," the meeting being held in Victoria Park, Beaverton,

On August 3rd, the Victoria County Medical Society met in Bobcaygeon, addresses being given by Dr. H. S. Hutchison on, "The modern treatment of nephritis," and by Dr. H. B. Anderson on, "Pituitary disease." After the meeting, the visiting doctors and their wives were taken for a cruise around Pidgeon Lake.

Dr. T. C. Routley and Dr. J. W. Marlow were present at the meeting of the Victoria Medical Society, at Victoria, B.C. on July 3rd, commencing there a comprehensive trip through the Canadian West, a trip taken largely to bring them in touch with the medical profession and medical societies of the western provinces. Dr. F. J. Tees, of McGill University, represented the Province of Quebec on the trip at the luncheon at the Empress Hotel. Dr. Routley spoke on the question of post-graduate education. Dr. Marlow addressed the meeting on, "The symptomatology of pelvic diseases," and Dr. Tees lectured on, "Fractures."

FREE DISTRIBUTION OF INSULIN

The Minister of Health and Labour, the Hon. Forbes Godfrey, has authorized the following plan for the free distribution of insulin, which is now being manufactured on an adequate scale by the Connaught Laboratories of the University of Toronto.

Insulin will be distributed free, on and after September 1st, to all patients certified by their physician as being unable to pay for the remedy. The physician will order insulin as required from one of the eight laboratories of the Provincial Board of Health, located at—Fort William, Sault Ste. Marie, North Bay, Owen Sound, London, Toronto, Peterborough, Kingston, and Ottawa. These laboratories will be in a position to undertake, for local physicians, any necessary laboratory work in connection with the control of the administration of insulin. There are now about 600 physicians, who have taken a short course of instruction on insulin treatment, given by the University and the Toronto General Hospital, and, in case of emergency, any physician who is not entirely familiar with the details of the treatment, may secure the assistance of an officer of the Provincial Board of Health, who will be prepared to undertake the necessary laboratory work for those patients who are unable to pay for Insulin.

By direction of the Minister, the Provincial Board of Health, is preparing a circular, which will be given to physicians, outlining in detail, the plan of free distribution.

MANITOBA

THE MANITOBA SANATORIUM

A reading of the annual report for 1922 of the Manitoba Sanatorium, Ninette, well repays those who are interested in the treatment of tuberculosis. The Medical Superintendent, Dr. David A. Stewart, may point with pride to the work which has been accomplished since the Sanatorium was opened in 1909.

Special attention has been paid during the past year to the better diagnosis and treatment of tuberculosis of the intestinal tract. Some wealthy citizen of Manitoba could not do better than to donate another Alpine Lamp for use in the treatment of intestinal tuberculosis. Thirty to forty patients at a time are undergoing treatment by artificial pneumothorax. As is so often the case the need for more infirmary beds is felt and the Superintendent writes: "We have come to believe that staying in bed *after* symptoms have been subsided is one of the very best measures."

Before the disease can be prevented the world must be educated. Education has been an important part of the work at the Manitoba Sanatorium for "thirty-three medical students and young doctors, apart from the regular staff, served an apprenticeship during the year." Seventeen public addresses were also given, six talks to patients, nine lectures to graduate and under-graduate nurses, fourteen addresses and five papers to gatherings of doctors and students, and five other papers or pamphlets were written."

Manitoba is better off than some of the other provinces in Canada but let us quote the summary of its position with regard to tuberculosis; "at present in Manitoba the general knowledge of tuberculosis, its symptoms, its menace, its treatment, is such that out of ten who apply for treatment only three are at early or even moderately advanced stages, seven have far advanced disease, and of these seven, two are utterly hopeless."

Obituary

Dr. Latimer Pickering died at his home on August the 5th.

Dr. A. D. Elliott of Lucknow, Ontario, died suddenly at Kincardine, on August the 2nd.

Dr. A. B. Riddell a graduate of the Toronto Medical School, died in Richmond, on July 30th, aged sixty-two years.

Dr. Gordon Bell, provincial bacteriologist and professor of pathology of the Manitoba University Medical School, died in Windsor, on August the 8th. Born at Pembroke, in 1863, he was educated at the collegiate institute there, and later studied medicine at the University of Toronto Medical School, and the Manitoba Medical College.

Dr. George William Major, aged seventy-two years, native of Montreal and formerly throat specialist attached to the Montreal General Hospital, died in London, England, where he had lived for thirty years in retirement, following his departure from Canada rendered necessary by the precarious condition of his health. Dr. Major was a graduate of McGill University and was the first throat specialist in Montreal. He was on the staff of the General Hospital here for many years, following study under the late Sir Morrell Mackenzie the noted London throat physician. Surviving Dr. Major are his wife and daughter in England, and two sisters in Montreal.

Dr. Albert Michell died in Toronto, on July 31st. Graduating at the University of Toronto in 1890, Dr. Michell began practice in Perth County, moving to Toronto six years ago.

It is with regret that we have to give notice of the death of the late **Dr. Fred W. Jardine** of Kensington, P.E.I. who died at the age of forty-five years. He was born September 21st, 1877. Dr. Jardine was attending to his large practice on the day of his death. He sat down to his evening meal and before he had finished, he fell off his chair and expired. Dr. Jardine was educated at Prince of Wales' College in Charlottetown. For some years he taught school. He then attended Dalhousie University, from which school he graduated with distinction, after which he started to practice at Kensington. He was a man of great energy, devoted to his profession and loved by his patients. He had been Mayor of Kensington on two different occasions. He leaves a widow, four sons and one daughter. His eldest son graduates from McGill this spring. He was a brother of Dr. John Jardine, of Scott, Sask.

Dr. S. P. Ford died in Norwood, Ont. on July 22nd, in his eighty-fifth year. A graduate of Buffalo, in 1864, and the University of Toronto Medical School, in 1869. He settled in Norwood, in 1874, and practiced there for forty-nine years. In his earlier life, Dr. Ford was assistant surgeon in the Federal army during the American Civil War. He took an active interest in educational matters and had been medical health officer of Norwood for several years.

Book Reviews

Nursery Guide for Mothers and Nurses By Louis W. Sauer, M.A., M.D. 188 pages, illustrated. Price, $1.75. Published by C. V. Mosby Company, St. Louis, U.S.A., 1923.

This little book covers the usual ground of the care of infants and children, is well written, and contains valuable information. In a book of this kind, however, it is questionable whether it is wise to incorporate so much regarding the diagnosis and treatment of the various conditions of childhood. Remarks of this kind frequently tend to unnecessarily alarm mothers and in many other instances parents may be tempted to treat and diagnose these ailments without the guidance of their physician, with sometimes disastrous results. The book would be more acceptable if matter of this kind were omitted. A B.

Books Received

Institutional Household Administration By Lydia Southard, B.A. 214 pages, with 91 illustrations. Price, $2.00. Published by J. B. Lippincott Company, 201 Unity Building, Montreal, 1923.

A text book of Therapeutics, Including the essentials of Pharmacology and materia medica. By A. A. Stevens, A.M., M.D. Sixth Edition, entirely reset. Octavo of 793 pages Price, $6.25. Published by W. B. Saunders Company, Philadelphia, 1923.

Les problems Actuels de Diététique. By P. Carnot and Marcel Labbé. 184 pages. Price, 8 frs. Published by J. B. Bailliere & Sons, 19 Rue Hautefeuille, Paris, 1923.

Les Colites. By Paul Carnot, Paul Harvier and R. Friedel. 224 pages, with 34 illustrations. Price, 10 frs. Published by J. B. Bailliere & Sons, 19 Rue Hautefeuille, Paris, 1923.

The Common Neuroses—their treatment and psychotherapy. By T. A. Ross, M.D., F.R.C.P.E. 256 pages. Price, 12.6, net. Published by Edward Arnold & Co., London, 1923.

The Hygiene of Marriage By Isabel E. Hutton, M.D. 112 pages. Published by William Heinemann (Medical Books) Ltd., London, 1923.

The Therapeutic Use of Digitalis By G. Canby Robinson, M.D. 137 pages. Price, $2.50. Published by Williams & Wilkins Company, Baltimore, 1923.

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WHAT OF THE FUTURE OF SURGERY?*

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IT is one of the frailties and conceits to which our nature is heir that man is ever prone to consider his present attainments to be the culmination of human effort, the summit of achievement, above and beyond which it is scarcely likely that great progress may be expected by those who come after him. Yet an historical survey of any field of human endeavour shows that such a view has usually proved to be baseless. In spite of periods of darkness and retrogression, due to the chaos of political, social and economic upheavals, the general trend has been forward. Doubtless an exception is found in the creations of man's imaginative nature, in literature and the arts. Homer, Phidias, Praxitiles, Raphael, Michael Angelo, Velasquez, Goethe, Shakespeare may not be disparaged by comparison with later men of genius; rather do they loom larger in perspective as the centuries pass. But where progress depends on man's control over the forces of nature, it appears inevitable and certain that no end may be assigned.

Does this apply to the science and art of surgery? So vast has been the progress in this field during the period covered by still living men, so final do many of its accomplishments seem, that a disciple may be pardoned for some scepticism as to the extent of further progress. A brief review of the chief factors which have contributed to the building of the edifice of modern surgery may help us to clarify our ideas as to the future.

Doubtless in pre-historic, and certainly in the earliest historic times, in communities of men, individuals were appointed or constituted themselves as especially qualified in the exercise of the healing art. More often than not this was associated with religious observances, and priest and healer were often identical. It is not unreasonable to suppose that even then there may have been some differentiation of physician and surgeon; that one individual more bold or hardy than another may have assumed the duty of extracting weapons from the bodies of those injured in battle, or of binding up wounds, or perhaps of completing in rude fashion the amputation of nearly severed limbs, while another may have cultivated or sought for medicinal herbs and compounded potions or balms, or by the exercise of mystic rites have anticipated the psychotherapy of to-day. Certainly, wherever the physically afflicted were ministered to, the measures employed may have corresponded to those recognized to-day as medical on the one hand and surgical on the other.

In ancient Egyptian civilization it appears that physicians were numerous and active, and specialism was clearly recognized, as according to Herodotus, a physician was wont to confine himself to the treatment of a single disease. That surgery was practiced is told by hieroglyphics and by ample evidence from tombs and mummies themselves. In the British Museum may be seen a mummy with a fracture of the forearm, with anterior and posterior splints applied in no inexpert manner. Among the Greeks medicine flourished, and anyone who fancies that most of the accepted practice of the present is modern in origin should examine the writings of Hippocrates, and marvel at the accurate descriptions of the mechanism of fractures and dislocations, the prevision of asepsis in the injunction to the surgeon to use only clean water or wine in the cleansing of wounds, and to cleanse his hands thoroughly before touching the parts, and the account of the healing of wounds by first or by second intention. The surgeon was an honoured and essential participant in the conduct of war, as many passages from Homer attest.

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In Roman civilization the healing art, as described by Celsus and by Galen, was chiefly in the hands of Greeks, and this identification with a conquered people injured the social prestige of the practitioner, who was frequently a slave. Nevertheless, the surgery of traumatisms flourished, doubtless on account of the almost constant state of warfare in which the Romans lived, and the technical aspect of surgery was probably advanced, as witnessed by the finding of over two hundred different surgical instruments in the ruins of Pompeii. Galen, who flourished in the second century, through his teachings and writings dominated the medical thought of Europe contemporaneously and for centuries later.

During the decline and after the fall of the Roman Empire, through the Dark Ages, medical learning was almost totally in abeyance, in common with other intellectual interests. Its traditions were preserved in two ways:—by the Arabs, who brought it back to Europe through the invasion of Spain, and by the monks in whose custody remained almost all the learning which survived from the classical period to the Renaissance. Surgery especially suffered in its repute because the monks were forbidden its practice, and it fell into the hands of the barbers, whose duty it was to shave and bleed them. Thus began the long period of degradation of surgery, which was practiced by barbers, bath-keepers, itinerant quacks and ne'er-do-wells. Naturally a definite schism developed between the physicians and surgeons; the latter were made inferior by papal and royal decree, and became little better than menials in the barbaric state of society which was Europe in the Dark Ages. Here and there appeared a man of intellectual ability and high character, developed into a surgeon by his humanitarian instincts in the cruel school of war, who naturally looked down on the barber-surgeon and sought recognition from his medical colleagues, only to be denied the privileges to which his accomplishments entitled him.

With the Renaissance came, as in other intellectual fields, a rebirth of the healing art. Vesalius, who flourished in the middle of the 16th century, is the central figure of this period; by his magnetic personality, his learning and his enthusiasm he was able to make the study of anatomy a pursuit of respectability and distinction instead of one which laboured under the displeasure of Church and State; he made researches in the physiology of the living, and accurate observations in pathology and in the clinical manifestations of disease. With his pupils, among whom were Eustachius and Fallopius, he substituted for the traditional dogma of Galen a practice based on the scientific method. Contemporaneous with him was one of the greatest surgeons of all time, Ambroise Paré, who, beginning as a barber's apprentice, became an army surgeon, acquired an enormous experience, and by dint of independent observation and reasoning broke away from many of the existing barbarous and futile methods of treating wounds, made use of the ligature in amputations, invented many surgical instruments, trusses and artificial limbs, and better than all, made himself so beloved and respected that his teachings were widely accepted.

Surgery now began to attract men of greater ability and influence and their claims to equal recognition with their medical colleagues were gradually crowned with success, though the 17th century found them still considered to be inferior. William Harvey, refusing to bow to the dogma which had been accepted for fourteen hundred years, proved by animal experimentation the truth about the circulation of the blood; the invention of the microscope at about this time enabled Malpighi to see the capillaries, and throughout the field of medicine exact observation, experimentation and logic succeeded to tradition and authority. Naturally the change was slow, especially in the field of surgery; the old rivalries, jealousies and intrigues between physicians, surgeons, and barbers continued, and surgery widened its sphere but little.

The 18th century brings the commanding figure of John Hunter, whose versatility included original research in comparative anatomy and physiology, and in experimental pathology. The new surgical procedures which he introduced were reasoned out from experimental data based on human dissection and animal vivisection, and from keen clinical observation. He may truly be said to have established surgery on a sound scientific básis, instead of permitting it to remain a mere mechanical method of treatment. Contemporaneous with him were Morgagni, who by the study of pathological anatomy correlated clinical symptomatology with the organic tissue change which underlies it, and Edward Jenner the discoverer of preventive inoculation.

The 19th century brings us to a period so recent that comment is almost superfluous. Until nearly the middle of the century, conditions changed but gradually. Surgery having become a component part of scientific medicine, the distinction between the sister branches largely disappeared. As in the halcyon days of the classic Greek period, the student of the healing art received exactly the same education in the underlying medical sciences whatever his ultimate aim in practice. He whose temperament led to bold and decisive action, who carried part of his education in his finger tips, and whose nature could be steeled to bear to inflict pain, turned to surgery, but he always remained also a physician. And surgery had still little enough to offer to the patient; the reduction of fractures and dislocations, amputations for trauma or gangrene, incision of abscesses, ligation of vessels for haemorrhage or aneurysm, the removal of external tumors, cutting for stone, herniotomy and the rare and frequently fatal invasion of the peritoneal cavity for ovarian tumor or Caesarean section. Though McDowell performed his first ovariotomy in 1809, laparotomy was almost unknown, and considered usually indefensible. With no agents except opium and alcohol to narcotize the patient, every operation meant the infliction of suffering comparable only to the tortures of the Inquisition or of savages; every consideration was sacrificed to speed. Add to this the practically inevitable wound suppuration, and the frequent incidence of the four curses of pre-antiseptic days, septicemia, pyemia, erysipelas, and hospital gangrene, and what wonder is it that surgery was a last resort, offered only in cases of dire necessity, and then only in a very limited field of surgery as we know it now?

Of the introduction of inhalation anaesthesia by Morton and Warren at the Massachusetts General Hospital, and of the development and application of Pasteur's discovery by Lister to secure surgical antisepsis, and of the subsequent development of asepsis, it is necessary only to make mention before this audience, to whom the stirring story is so familiar. Pain was abolished, surgical wound infection vanquished, and the field of surgery rapidly extended. The urgent lesions of the abdominal, craniovertebral and thoracic cavities were attacked with success. The study of what has been aptly called by Moynihan the "pathology of the living" on the operating table, together with amazing advances in physiology, pathology, bio-chemistry and in means of diagnosis by instruments of precision have brought innumerable lesions from the borderland into the field of surgery. It is indeed a far cry from the barber surgeon of the Middle Ages to his successor of to-day who is admittedly the chief agent of the art of healing in bringing to suffering humanity direct, concrete, and often permanent relief and cure of its ills. It is no extravagant statement to say that surgery is the chief and most important therapeutic agent which the science and art of medicine possesses, and to its credit may be placed a saving of human life comparable to the work of inoculation, hygiene, and preventive medicine. The fact is that the distinction between surgeon and physician is often too sharply drawn both by the profession and the public; the two should be regarded as identical in the scientific foundation of their knowledge and in their viewpoint; divergence comes only in the application of a therapeutic method. Indeed the physician who practices paracentesis of pleura, pericardium, neural canal, abdomen and joints, who compresses the diseased lungs by creating a pneumothorax, or divides intra-pleural adhesions, or aids diagnosis by injecting air into the peritoneal cavity, or bleeds his patient, or performs transfusion, or administers intravenous therapy, is using methods essentially surgical in their character,—while on the other hand, the surgeon constantly borrows from the practice of the physician. No human mind can have a working knowledge of the whole field of modern medical science, but the surgeon must be at least as familiar as the physician with the anatomy, pathology, and pathological physiology which underlie the conditions which he treats, and also with their clinical phenomena. Because of the exaction on his time and strength by the therapeutic method he employs, he cannot keep himself fully in touch with progress in purely medical fields, but even here the more he is able to do so the more effective he will be. The surgeon who stands by the operating table knife in hand and says to the patient's physician, "Tell me what you wish me to do and I will do it," is not a surgeon but merely a surgical technician; yet there are men who are willing to play this rôle as well as physicians who encourage them to do so. The one is as truly a descendant of the barber surgeon as is the other the heir to the pompous, pedantic and complacent physician of the 17th century depicted by Molière.

What is, then, the present status of surgical science, and what the probabilities of future advance? Consider the factors which have brought surgery to its present state of development, and inquire whether each is likely to progress. Omitting from consideration the underlying sciences, the three great factors have been anaesthesia, the control of infection, and the development of the surgeon's armamentarium; instruments for the control of bleeding, for the exposure of deep-lying organs, special and diagnostic instruments of all sorts. It is hard for us now to realize how recently the control of haemorrhage was a cause of anxiety in almost every operation; how impossible was the execution of many now common procedures without the special instruments recently devised.

Anaesthesia is not a closed chapter; constant improvement is being made in the use of old and tried agents, and new methods are constantly being introduced; but it is a fair statement that it has reached a high state of perfection. With ether, nitrous oxide and oxygen, ethylene and chloroform, with administration by inhalation, by injection into the rectum, or by direct introduction into the circulation; with practically non-toxic substances for injection locally or into nerve trunks or the spinal canal, we have at our command methods which enable us to carry out almost any surgical procedure without anxiety lest the anaesthesia itself will cause disaster. Doubtless the ideal anaesthetic remains to be discovered; it will probably be a harmless substance taken by mouth or injected into the circulation, and inducing a natural sleep without ill after results; but in view of the fact that under well conducted nitrous oxide-oxygen anaesthesia the patient may be subjected to a three or four hour operation without serious ill effects,—in other words, for as long as a surgeon can work with skill, patience and success—it seems unlikely that any new development in the field of anaesthesia will widen very greatly the field of surgery.

The factor of asepsis is in all probability a fixed one. Omitting the chance of error through human fallibility, it is apparent that a clean operation can now be conducted about as aseptically as will ever be possible. Antisepsis, however, is a different matter. The ideal antiseptic, bactericidal, but non-toxic to human tissues, still elusively avoids discovery, but greater approximation to this ideal is constantly being made, and when found, the effectiveness of surgery will be greatly increased, though its application will not necessarily be much widened.

Of the third factor, the surgeon's armamentarium, it is not necessary to speak at length. Human ingenuity will continue to improve the physical means of diagnosis and treatment, and experience will continue to develop the technique of the operator, so that operative mortality will be lowered and the field of surgery extended.

Mention must be made of another matter in this connection which constitutes the most serious and yet the most easily remediable handicap to the success of surgery,—namely, delay in resorting to its aid. Every surgeon knows, and every physician should realize, that in the overwhelming majority of instances the success or failure of the former depends on early and prompt operation. All three participants in the all too common tragedy of disaster through delay may not be without blame; the patient, because he fears what inquiry will reveal and procrastinates in seeking advice, or listens to the plausible cajoleries of those who practice the pseudo-medical cults; the physician, because he is careless or casual in his examination of the patient or is not prompt in seeking consultation; and the surgeon, if he fails to exercise every precaution and expedient to establish a diagnosis and safeguard his work. The remedies for these faults need no discussion.

Looking at the present status of our art, it is possible perhaps to hazard some predictions as to future progress. It is now technically possible for the surgeon to remove any one of the organs of the body not absolutely essential to life, and where such essential organ exists as a paired viscus, one member of this pair may be sacrificed. There appears to be little hope that these vital structures may be substituted for by transplantation from animals, since the tissues of animals, or even of other human beings inevitably, with a few apparent exceptions, have undergone solution when transplanted. Possibly biochemistry may solve the problem of rendering our tissues receptive to homogeneous or heterogeneous transplantation, but it seems unlikely.

Further progress, based on increasing knowledge of normal and pathological physiology, and on improved operative technique will continue to be made in all existing branches of our science. The surgery of the thoracic viscera is but in its infancy, and we may confidently expect to see the removal of portions or the whole of a diseased lung with a mortality much less than the now prevailing one of about 50 per cent. Certain valvular lesions of the heart, especially mitral and aortic stenosis will be attacked and the constricted opening enlarged sucessfully; occasionally a brilliant removal of a cardiac or pulmonary embolus will be done. Cancer of the esophagus will cease to present the almost hopeless problem which confronts us to-day. The abdomen is a field which appears to be pretty well tilled, although progress may be made in connection with a better understanding of the physiology of the spleen and adrenals, and possibly also of the pancreas and liver. In the vascular system, embolectomy and the restoring of impaired circulation will be developed. In the central nervous system, the astounding progress made in recent years promises further advances, among the most needed of which is the relief of hydrocephalus. The best surgical work on the brain and spinal cord is now necessarily concentrated in the hands of a few brilliant men, but a younger generation of neurological surgeons is being trained, and the coming years will show a vast increase in the benefit to suffering humanity in this field.

Future epochal advances in the domain which now belongs to the science of surgery appear to be likely inevitably to withdraw much from that domain and return it to the general control of the healing art, whence the science of surgery had taken it. For example, consider the problems of malignant disease, and of infection. Can anyone doubt that the problem of cancer will be solved? We know that there is an immunity to cancer; we have seen a rapidly growing carcinoma of the breast successfully removed, only to find at autopsy twenty-three years later that death was caused by a metastasis in the brain. This situation precludes an independent tumour arising *de novo*. Such a patient must have developed an immunity which almost overcame the disease. Moreover, it appears that there are a few dependable records of the spontaneous cure of cancer. Within the year, the agent of this immunity may be found, as simply and as logically as was insulin, and when found, this scourge of the race will be no longer in the province of the surgeon. In the meantime, until this blessed event, it is a reasonable hope that some form of radiant energy may control and destroy tumour growth and render operation unnecessary.

The same is true of surgical infection. The development of artificial immunity here is certain to progress and we may confidently expect the time when the diagnosis of an infectious process, whether it is osteomyelitis or empyema, or cellulitis, or appendicitis, or cholecystitis, will be followed at once by the administration of the appropriate serum or anti-toxin, so that surgery will be unnecessary except sometimes to repair damage when treatment was instituted too late.

When malignant disease and surgical infections are removed from the field of surgery, what will be left? The repair of injuries, the correction of congenital and acquired deformities, the relief of conditions incidental to the tissue changes of old age such as arteriosclerosis, prostatic hypertrophy, cataract—though even these may be susceptible to treatment by some as yet undeveloped type of physical energy, the restoration of organs displaced from their natural seat, and hernia. When the sphere of surgery shall thus have happily narrowed, much of the genius and time and patient research now devoted to its problems will be freed to be expended in other ways for the benefit of mankind.

VERTIGO AND ITS SIGNIFICANCE IN GENERAL MEDICINE*

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THERE is probably no one symptom with which the physician in general practice so often comes in contact, as that of vertigo, and also, there is probably no one symptom to which so little attention is paid as that of vertigo. During the past few years the writer has had referred to him for investigation some 250 medical and surgical cases in which dizziness was a predominating symptom. In many of these cases the dizziness was associated with nausea and vomiting; in others, with headache, equilibrial disturbances, muscular weakness, dyspnoea, and other symptoms.

We have been so accustomed in the past to look upon dizziness as something associated with minor gastric, cardiac, and intestinal disturbances, that the terms, gastric vertigo, cardiac vertigo, etc., appear to be still much in vogue, although, in the light of recent researches, we know that these terms are misnomers and that vertigo is a definite clinical entity due to disturbance of distinctive senses.

What is vertigo and how is it produced?—Vertigo, or dizziness, from whatever cause, may be defined as "a subjective sensation of a disturbed relationship to objects in space" (I. H. Jones). In its broadest sense one may consider it as "a sense of confusion resulting from any false perception of one's relative position to space or motion in space." (Mackenzie). All vertebrates, including man, tend to maintain a definite orientation with reference to the lines of gravitational force, or, in other words, to maintain their equilibrium.

Mach and Breur distinguish two kinds of equilibrial function:

(1) The "static," by which is produced a definite orientation with reference to the lines of gravitational force.

(2) The "dynamic," relating to movements of rotation. Any disturbances of these functions result in both *subjective* and *objective* manifestations. To the subjective we apply the term vertigo or dizziness. Numerous investigators in the realms of physiology, experimental biology, as well as otology and neurology, have determined accurately the normal compensatory movements and positions.

The maintenance of equilibrium depends on afferent impulses received by the cerebellum from three chief sources.—"The function of the cerebellum is to receive proprioceptive impulses from the body along with labyrinthine and visual impressions, and to integrate and develop from them impulses which, by being transmitted to the cerebral and other nerve centres that dominate muscular movements, so co-ordinate the nerve discharges from them that, when muscular movement occurs, it does so in relationship to the previous position of the animal and in the most efficient way to attain the object for which the movement was made. The cerebellum is the head nucleus of the proprioceptive system." (Macleod).

The so-called proprioccpters situated in the muscles, tendons, and joints respond to differences in tension, contraction, or relaxation of the different body muscles, tendons, and ligaments. The centripetal impulses thus generated are transmitted to the cerebellum *via* the posterior columns of Burdach and Goll as well as the lateral cerebellar tracts in the spinal cord. This sixth sense, the kinesthetic sense, serves to supply some information regarding the exact position of the body in space.

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Associated with the kinesthetic sense in the maintenance of equilibrium we have the visual sense embodied in the visual organs, namely, the eyes, including their intrinsic and extrinsic muscles. Also, the third sense, and the most important one, the static-kinetic sense. The latter is supplied by the receptors situated within the membranous labyrinth of the internal ear. The three semi-circular canals are approximately in the horizontal, vertical, and sagittal planes, and the receptors are specialized for the purpose of responding to changes in the position of the head and therefore of the body in general.

The centripetal impulses generated by stimulation of the delicate hair cells of the maculae acousticae are transmitted by the vestibular fibres of the eighth nerve to Deiter's nucleus group and thence through the inferior cerebellar peduncle to the roof nuclei of the cerebellum on the same side. I. H. Jones has shown clinically and pathologically that different tracts may exist for both horizontal and vertical fibres, but it is not within the scope of this paper to discuss at any length the different views held regarding the exact distribution within the brain itself of the vestibular fibres and their intracranial connections.

It will be apparent that any abnormal stimulation of any one of these three senses, or any interference along the tracts by which the centripetal impulses travel, will result in that unpleasant sensation of confusion known as vertigo and in proportion a disturbance of equilibrium.

S. S. Maxwell, in his recently published monograph on equilibrium, has confirmed the findings of others, and has given us the objective signs or manifestations resulting from the experimental over-stimulation of each group of receptors and the destruction of certain portions of each of them. The loss of any one of these senses may cause temporary vertigo and disturbance of equilibrium, but, in many cases, within a comparatively short time the body may learn to accommodate itself by depending upon the other two senses.

According to Lewandowsky, the cerebellum is constantly sending out impulses producing tonic contraction of the muscles of the body, the so-called synergic impulses. The researches of Edinger, Bing, and Bárány go to show that the vermis of the cerebellum has the function of controlling the tonicity of the trunk, and that the lateral lobes are responsible for the tonicity and co-ordinate movements of the extremities. In the movement of an arm or leg, the conscious will proceeds from impulses from the cerebrum, but the guidance of the movement is through impulses from the lateral lobes of the cerebellum. Friesner states that the cerebrum originates movements and the cerebellum carries them out.

As far back as 1825, Flourens noted a definite relationship between the labyrinth of the ear and equilibrium. The classical experiments of Ewald, and the later ones of Purkinje, Bezold, and others, proved this relationship. Luciani, Majendie, and Loeb have thoroughly established the fact of the influence of the labyrinth of the ear on general muscular tonus. In 1861, Ménière described a syndrome with which his name is still associated, namely, vertigo, deafness, tinnitus and vomiting on attempting to move. In the one autopsy which he reported, there was found a sanguinous exudate filling the labyrinth of the ear; and for many years we have been accustomed to speak of almost any and every severe attack of vertigo, as "Ménière's disease." We may consider that the term "Ménière's disease" now occupies the same relationship to general medicine as eczema does to dermatology, that is, in most cases it is a name used to cloak our ignorance of the real pathological condition.

Time does not permit of our discussing Bárány's many experimental and clinical findings in cases of vertigo, associated with disturbances of equilibrium. Suffice it to say, that in 1915 he was awarded the Nobel Prize for his great contribution to this subject The systematized neuro-otologic diagnostic methods elaborated by him, constitute, perhaps, the most valuable aid we have in the accurate diagnosis of conditions associated with vertigo.

Let me briefly refresh your memory regarding Bárány's diagnostic methods—the so-called "Bárány tests." These tests consist in turning a patient in a revolving chair ten times to the right then repeating the turning ten times to the left. The syringing of each ear separately with water at a temperature of 68 degrees Fahrenheit, with the head placed at an angle of thirty degrees forward, and also syringing with the head placed at an angle of sixty degrees backward from the vertical. These tests cause a stimulation of the endolymph in the internal ear, and the centripetal impulses thus generated are carried along the vestibular fibres to the cerebellum and result in certain definite and constant phenomena in the normal individual. These phenomena are: dizziness, rhythmic nystagmus, and a definite past-pointing. The nystagmus varies in amplitude, duration, and kind, according to the stimulation received, and the position of the vertical canals of the labyrinth in relationship to the body trunk. It is not my intention to-day to discuss at any length the reason for these phenomena, but it is quite apparent that if these are constant in the normal individual, any lesion within the labyrinth itself or along the pathways of the vestibular fibres within the brain will prevent impulses thus generated from being received by the higher centres, and will cause either the complete absence of, or a distinct change in, these phenomena.

T. H. Wiesenburg, in discussing lesions of the central nervous system, emphasizes the fact that where there is the slightest suspicion of a lesion in the posterior cranial fossa, the investigation should include a complete neurological examination and the Bárány vestibular tests. Grainger Stewart advocates the closest co-operation between otologists, neurologists, and physicians, in all cases showing evidence of dizziness.

In the investigation of a patient who complains of attacks of vertigo associated with other symptoms, it is essential that our examination should be particularly directed to the investigation of the three senses which contribute to the maintenance of equilibrium, *i.e.*, the kinesthetic or muscle sense, the visual sense, and the static-kinetic sense.

(1) *Examination for Nystagmus.*—The presence or absence of spontaneous nystagmus, as well as its character and direction, should be noted. Many normal individuals exhibit a slight nystagmus. Such physiological nystagmus is present only when the eye muscles are put on tension, as in looking intently to the extreme right or left. It is of equal intensity to either side. Nystagmus, either rotary, horizontal, or combined, and of a rhythmic character, with a definite slow and quick component, is usually of vestibular origin and best seen when the patient does not fix an object. "Cerebellar nystagmus is essentially a fixation nystagmus, that is, it can be seen as a rule only when a patient fixes an object." (Gordon Holmes). Undulatory nystagmus—to and fro movements of the eye of equal intensity to either side when looking straight ahead—is usually of ocular origin, *e.g.*, so-called "miner's nystagmus." A vertical nystagmus is always pathological in origin.

(2) *Rhomberg test.*—It is essential to distinguish between a true and false Rhomberg, as many functional cases will exhibit the latter.

(3) *The pelvic girdle test,* or the attempt to overthrow. According to Bárány, a positive reaction indicates a lesion of the vermis of the cerebellum.

(4) *The rotation and caloric tests, and* Bárány *index test,* will inform us as to the condition of the vestibular fibres and their intra-cerebral connections and also the cerebellar centres.

(5) *The Babinski-Weil test,* which consists in walking forward and backward with the eyes closed is one which detects the slightest equilibrial disturbances and indicates most precisely the direction of the pathological impulses in the mild cases most often met with. (Bourgeois and Dundas-Grant).

(6) *The galvanic electric test*, or galvanic stimulation of the eighth nerve, helps to differentiate between a peripheral nerve and a central lesion.

(7) *Testing for adiadokokinesis, dysmetria,* and *asynergia:* this is indicated in all cases of vertigo.

(8) *Ophthalmological examination* for errors of refraction, muscle weakness, and fundus changes, is of importance to exclude ocular vertigo.

The writer wishes to stress particularly the fact that the above tests, to be of any value in the differential diagnosis of conditions causing vertigo, must be carried out in a most painstaking and thorough manner, and, if it is possible to have the patient under observation for a short period, they should be repeated at intervals of several days. Faulty technique in examination was responsible for the failure to detect lesions in several cases that have come under my observation.

In considering the cases which have been investigated by us it will be convenient for purposes of discussion to classify them under four heads:

(1) Lesions involving the visual sense.

(2) Lesions involving the vestibular or static-kinetic sense.

(3) Lesions involving the kinesthetic sense.

(4) Lesions of central origin.

Ocular vertigo.

Ocular vertigo is usually of a mild type and unaccompanied by disturbances of equilibrium or vomiting, although, in the severe types, the latter may occur. The patient usually describes it as swimming of the head, black specks before the eyes, a sense of constriction between the eyes, or frontal headache. It is more easily recognized by the physician owing to the fact that relief is immediately given by closure of the eyes. Errors of refraction, eye muscle weakness or paresis, incipient cataract, etc., are etiological factors. One frequently observes it in cases of arteriosclerosis in which there is probably some involvement of the eye muscle nuclei or visual centres. Movements of the eyes tending to place the muscles on tension, such as, star gazing or looking to the extreme right or left, is frequently given by the patient as the exciting cause. Train sickness may be considered as a severe form of ocular vertigo due to the attempt to fix the eyes on quickly passing objects.

Vestibular or rotational vertigo.

Cases of severe vertigo are more often of this type and are described by the patient as a sensation of external objects moving rapidly, and usually in a horizontal plane. If the eyes are closed he feels as if he himself were being turned rapidly. During an attack inability to maintain equilibrium is manifested. Several patients have described their attacks as resembling acute alcoholic intoxication. Attacks may be of a few seconds duration or last several days. If prolonged, severe nausea and vomiting associated with headache, marked pallor, diaphoresis, and extreme weakness are present. Quick movements of the head, or the attempt to sit up in bed tend to increase the vertigo, and, in proportion, the nausea and vomiting. Nystagmus is usually present *during* the attack and is of the rhythmic type. Alexander and other authorities claim that nystagmus is always present, but the writer has observed two cases of very severe vertigo in which nystagmus was absent. Etiological factors are:

(a) *Lesions involving the non-acoustic labyrinth*, namely, congestion, irritative or destructive, serous or suppurative, toxaemia, and new growths.

(b) *Lesions of the eighth nerve*, namely, neuritis, specific or non-specific, meningitis, tumours, etc.

(c) *Intracranial lesions involving the vestibular tracts to the cerebellum or the cerebellum itself*, namely, new growths, infarct, thrombosis, abscess, gumma, tubercle, etc.

In peripheral lesions, the nystagmus is definitely rotary in character, and in acute destructive lesions it progressively diminishes in intensity until it finally disappears within a fortnight or three weeks. Nystagmus of central origin is usually less definite in character and may be either horizontal or vertical. If the central lesion is progressively destructive the nystagmus persists and increases in intensity.

Spontaneous or provoked deviations (Bárány *Index test*).—It is important to distinguish between interference with the cerebellar centres due to a local destructive process in the cerebellum itself or local pressure, and that due to a general increase of intracranial pressure. A spontaneous pointing error disappearing after relief of increased intracranial pressure by surgical or other means, indicates that the interference with the function of the cerebellar centres was due to generalized pressure and *not* to a lesion in the immediate vicinity of the centres. Sea-sickness has been shown by Bárány to be due to the continuous abnormal stimulation of the vestibular apparatus.

The following cases are illustrative of the rotational type of vertigo:

Case 1.—J. M., male, aet. 40. Complaint: Attacks of dizziness, headache, severe nausea, vomiting, and general weakness. Duration, three years. Has been picked up on three occasions in the street in a semi-conscious condition. *General Physical examination* (3.9.22) negative. *Neuro-otological examination*—Marked hyper-irritability of vestibular apparatus right side, impaired hearing. Large cholesteatomatous mass filling right middle ear. *Diagnosis:* Irritative peripheral lesion. *Treatment:* Radical mastoidectomy, removal of cholesteatoma, primary skin graft. *Result:* No further attacks up-to-date (1.5.23) and an increase in weight of twenty-two pounds.

Case 2.—T. M., male, aet. 38. Complaint: Attacks of severe giddiness associated with right parietal and frontal headache, backache, and general malaise. Duration, five years. States has been under treatment for nephritis since 1917. *General physical examination*—negative. *Neurological report* (29.8.22). No evidence of disease of central nervous system. (Fletcher). *Kidney function test*—normal. *Urinalysis:* Sp. gr.

1020, slight amount of albumen, no casts. S.B.P. 135; D.B.P. 90. *Neuro-otological examination:* Vestibular fibres right side markedly hyper-irritable. Some necrosis of ossicles of right middle ear and fistula leading into right horizontal semi-circular canal. *Diagnosis:* Irritative peripheral lesion. *Treatment:* Radical mastoidectomy, closure of fistula. *Result:* No further attacks up-to-date (1.5.23). Urinalysis normal on five different occasions.

Both these cases had peripheral lesions causing irritation of the labyrinthine receptors. In the second case, the previous diagnosis of nephritis was definitely shown to be an incorrect one, and the albumen which was found immediately following attacks was apparently due to the focus of infection within the ear. The correct diagnosis was possible only by employing Bárány's diagnostic methods.

Case 3.—G. C. S., male, aet. 27—Admitted to hospital, 1.1.23, as an emergency case with the diagnosis of "acute abdomen." *Complaint:* Severe headache, dizziness, vomiting, and abdominal pain. Duration, six hours. States had previous similar attack in England, 1917, at which time an appendectomy was performed. In 1919, had an abdominal operation for adhesions. Has had slight attacks associated with a dull pain behind right eye off and on for the past two years. *Surgical report* (1.1.23): No evidence of abdominal condition requiring surgical interference. (N. Shenstone). Gastro-intestinal X-ray series negative for gastric and duodenal ulcer. Kidney function test normal. *Neurological report:* examination reveals no definite evidence of a gross lesion. (G. F. Boyer). Spinal fluid normal. Wassermann blood and spinal fluid negative. *Neuro-otological examination,* (9.1.23): Total nerve deafness right. Rhomberg positive slight to left. Babinski-Weil test positive to right. Slight rotary spontaneous nystagmus on looking to right and to left. Right vestibular fibres definitely hypo-irritable. (R. S. Pentecost). *Re-examination,* (22.1.23): dizziness less marked. No vomiting for past week. Hearing right ear, two feet, left, twenty feet. Right vestibular fibres completely inactive, left normal. (R. S. Pentecost). *Re-examination,* (15.2.23): hearing right, eighteen feet, left, twenty feet. Right vestibular fibres now active but sluggish. (R. S. Pentecost). *Conclusions: Diagnosis*—an irritative lesion of the cerebral connections of the right vestibular fibres, of non-specific origin, but not sufficient to produce gross clinical findings indicative of cerebral pressure. (G. F. Boyer and R. S. Pentecost). In view of the history of an attack of a similar nature in 1917, the diagnosis of appendicitis made at that time is open to question.

Vertigo associated with trauma.—In perforating wounds of the head with or without trauma of the temporal region, attacks of vertigo of the vestibular type are almost a constant symptom. In cerebellar wounds, André Thomas has observed a syndrome of cerebellar type—vertigo and disturbance of equilibrium both at rest and when walking, associated with asynergia, adiadokokinesis and other manifestations. Cranioplasty, with repair of the cranial defect by grafts of bone, cartilage or fascia gives relief from dizziness in a large proportion of cases.

Kinesthetic vertigo.

Vertigo of this type is of a very indefinite character, and is more often described by the patient as a sense of confusion, associated with difficulty in estimating his exact relationship to surrounding objects. It is particularly noticeable in the dark or with the eyes closed. It is one of the earliest symptoms in diseases attacking the posterior columns of Burdach and Goll, or the lateral cerebellar tracts in the spinal cord. Owing to the slow and gradually progressive nature of most of these chronic conditions the vertigo is usually of a mild type and less marked than the equilibrial disturbances. "In certain cases of tabes dorsalis the proprioceptive sensations are lost and the patient, therefore, has vertigo and marked disturbances of gait, unless the movements are guided or controlled by vision." (Gordon Holmes). Acute polyneuritis involving sensory nerves will also produce vertigo of this type, according to Mackenzie. The presence of normal compensatory movements on stimulation of the vestibular apparatus, and the absence of signs pointing to an ocular or central lesion, together with a complete neurological examination, will serve to establish the diagnosis.

Vertigo, associated with hypertension as in nephritis, and hypotension as in Addison's disease or Graves' disease, is also frequently met with by the physician.

Vertigo associated with cardio-vascular disease.

In the cases examined by the writer in which general physical examination showed evidence of definite cardio-vascular disease, the vertigo was of the following type, *viz.*, swimming sensation of the head, specks before the eyes or blackness, with more or less dyspnoea on exertion, but unaccompanied by nausea, vomiting, or equilibrial disturbance and unaffected by quick movements of the head. One may divide the cases into two groups:

(*a*) Those in which vertigo occurred with change in position of body (from stooping to standing position, or getting out of bed quickly).

(*b*) Vertigo occurring particularly on the *cessation of sustained effort* (the attempt to lift heavy weights, running to catch a car, etc.).

According to L. M. Murray, fainting is quite another phenomenon and depends on a vaso-vagal disturbance. The examination for effort reaction is of importance in these cases.

Cerebro-spinal syphilis.—"In many cases of meningo-vascular neuro-syphilis, vertigo of a transient character associated with loss of memory is the first definite symptom of the disease." (Tilnay). The value of a neuro-otological examination in cases of syphilis involving the nervous system is illustrated by the following case:

Case 4.—M. D., female, aet. 28—Has been fairly healthy except for some eye and throat trouble as a child. Married four years. No miscarriages. One healthy child age three. *Complaint:* Attacks of dizziness, occasionally associated with nausea and vomiting, increasing deafness. Duration six months. During the past two months attacks have become more frequent and patient becomes very tired on the least effort and is forced to rest for several hours during the day. *General physical examination*, (25.9.22), negative. Some scarring of the pharynx. *Neuro-otological examination*, (26.9.22): Nerve deafness almost complete right and of a slight degree left. Right vestibular fibres almost completely inactive with loss of compensatory movements on stimulation. Left decidedly hypo-irritable. *Diagnosis:* Involvement of both acoustic and vestibular fibres on both sides—lesion situated in brain stem and probably syphilitic. Wassermann test of the blood made September 9th, 1922, was triple plus, confirming the diagnosis of syphilis. Anti-syphilitic treatment was at once instituted, and, on examination on April 20th, 1923, patient stated that she felt very much improved in general health and her attacks of dizziness were less severe. There was slight improvement in hearing of the left ear but no change otherwise in physical findings. Information received at a later date in a letter from the family physician who treated patient as a child, would indicate that this patient's syphilis was congenital in origin and had remained dormant for many years.

Central vertigo.

Under this heading we may include the type of dizziness due to disturbances within the brain itself. This is less defined and distinct than the others previously mentioned and may be due to a variety of causes:

(1) *Cerebral congestion or cerebral anaemia.*—Cerebral congestion may be present in many cases of acute infectious disease, and cerebral anaemia is particularly noticed in cases of arteriosclerosis, enarteritis, pernicious anaemia, and other conditions affecting the cardio-vascular system.

(2) *Toxaemia*, either acute or chronic.—Among the *acute* toxaemias one might mention alcohol, tobacco, and the toxins generated during acute infections. *Chronic* may include, auto-intoxication of intestinal origin, and particularly focal infections in the tonsils, teeth, and other areas. Cases of vertigo due to evanescent toxaemia probably constitute a large proportion of the cases of mild vertigo seen by the physician.

(3) *Focal lesions in the brain* of vascular origin as described by Pierre Marie, including perivascular and paravascular sclerosis, miliary haemorrhages, and complete or incomplete areas of miliary softening, are a frequent etiological factor. In 69 cases of multiple sclerosis recently reported by Fischer, vertigo was present in 51%. The writer has examined several cases of disseminated sclerosis in which vertigo was present, and in all there were objective signs of definite interference with the tracts of the vestibular fibres.

(4) *Brain Tumour.*—"Dizziness is rarely absent in growths below the tentorium, and is one of the earliest symptoms of brain tumour in any area. The curious tilted attitude of the head seen in some cerebellar cases, is probably of vestibular rather than cerebellar origin." (Foster Kennedy). In a series of ten cases of tumours of the cerebello-pontine angle reported by Vail, from the Cushing Clinic, the examination by means of the Bárány diagnostic tests showed constant and definite findings in every case. I. H. Jones, Bárány, and others have reported many cases of tumours of the posterior fossa accurately localized by these tests. The following case ex-

amined by the writer is of interest from this standpoint:

Case 5.—W. P., male, aet. 34. Complaint: Dizziness noticed when he turns quickly or exerts himself and described by him as similar to seasickness; headaches, sometimes frontal but lately occipital; general weakness. Duration, six months. *General physical examination,* 17.11.22. Some mitral insufficiency without hypertrophy of the heart. (L. M. Murray). *Neuro-otological examination,* (29.12.22). Findings—a definite spontaneous outward deviation right arm three inches but not constant. On walking with eyes closed, patient deviates definitely to the right. Rhomberg—indefinite. Vestibular apparatus appears otherwise normal. (R. S. Pentecost). *Eye report,* (21.2.23). Right and left vision 6/9ths. Field of vision full. Fundi normal except arteries are small and do not give one the impression of being healthy. (W. Wright). *Neurological report,* (22.2.23). Some symmetrical atrophy, no tremor, reflexes normal, Rhomberg present but of hysterical type—patient always falls to the nearest support. Positive Von Graefe. Impression—tentative diagnosis—psychic neurosis. Recommend further close neurological observation. On February 23rd, 1923, the patient became quite ill and was admitted to another hospital and kept under observation until death occurred March 12th, 1923. During this period, neurological reports indicate the development of a definite optic neuritis on both sides, spontaneous nystagmus to both sides probably more marked to right, tongue pushed to left side, suggestive ankle clonus and Babinski left, confused mental condition. The diagnosis of right frontal tumour is recorded. The patient died before operation could be performed. *Pathological report:* "Cyst $1\frac{1}{2}'' \times \frac{1}{2}''$ located in the right side of cerebellum and evidently arising from the white matter, diffuse haemorrhage."

The writer did not have the opportunity of examining this patient after the onset of his acute symptoms and there is no record of any re-examination of his vestibular apparatus while in hospital. It is worthy of note that dizziness was the first symptom complained of, and the first abnormal objective finding was an interference with the inward pointing centre of the right side of the cerebellum. It is regretted that subsequent neuro-otological examinations were not made, as in all probability it would have made possible a more accurate diagnosis of the site of the lesion.

Case 6.—F. W. P., male, aet. 38. Complaints: Attacks of vertigo of indefinite character followed by temporary unconsciousness and the desire to sleep. Duration, four years. Patient has been under observation in a mental hospital for the past two years and was discharged one month ago with the diagnosis of hystero-epilepsy. Admitted to hospital, May 12th, 1923. *Neuro-otological examination,* (17.5.23). Complete absence of all reactions to the rotation, caloric, and electric tests, on both sides. Slight impairment of hearing left side, due to middle ear involvement. Hearing right, normal. *Diagnosis:* Central lesion in the vicinity of the crura. In considering the above case it is of interest to note that previous general physical and neurological examinations revealed no evidence of disease. The diagnosis of hystero-epilepsy would, therefore, appear to have been justified. The patient is at the present time being kept under observation in the neurological wards.

Case 7.—The following case is illustrative of vertigo due to evanescent toxic irritation from a focal infection: *W. K., female, aet. 33.—Complaint:* Attacks of dizziness of indefinite character associated with loss of appetite, general malaise, and disinclination to do any work entailing physical or mental effort. Duration, three years. Previous history negative, except for an attack of pneumonia at age of eighteen. Present history—states attacks are of mild type usually lasting two or three days and associated with headache and slight sore throat. *General physical examination,* (6.2.21), negative. *Nose and throat, and neuro-otological examination,* (10.2.21). Vestibular apparatus normal, but hyper-irritable. Tonsils show definite evidence of focal infection. Advise tonsillectomy. *Treatment:* Tonsillectomy for removal of focal infection. *Result:* No further attacks of vertigo, etc., up-to-date, (March, 1923).

Psychic vertigo.—Dizziness of psychic origin can hardly be considered as true vertigo. The normal individual is able to walk without difficulty along a narrow plank placed on the ground. If requested to walk along the same plank placed at a great height he would, in all probability, be seized with severe dizziness. This type of vertigo may be considered of pyschic origin and to have no relationship to vertigo of pathological origin. M. Coué, the apostle of auto-suggestion, would have us believe that all vertigo is of this type.

In considering cases of vertigo in general, the question of its relationship to abnormal blood pressure is of interest. It would appear that many physicians incline to the view that nearly all cases of vertigo are associated with an abnormal blood pressure. In the series of cases examined by the writer, only four showed any appreciable abnormality in blood pressure.

Summary:

(1) Vertigo is the result of interference with the function of either the vestibular, ocular, or kinesthetic senses. It varies in character from a slight sensation of swimming of the head to a sensation of a definite rotation of the body and of external objects. In some cases, the resulting nausea or vomiting, or equilibrial disturbances, may be the chief complaint of the patient.

(2) The etiological factors are numerous, and, in the differential diagnosis, it is essential that one should obtain a detailed statement from the patient as to the character of the vertigo, whether influenced by change in position of the body, quick movements of the head, or closure of the eyes.

(3) The examination of the patient should include a general physical examination, and, in cases of severe or persistent vertigo, a complete examination of the ear and vestibular apparatus according to the systematized diagnostic methods of Bárány and Jones.

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THE EFFECTS OF ETHER ANAESTHESIA ON AFFERENT PATHS IN DECEREBRATE ANIMALS

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CRILE and Lower[1] have contended that "ether anaesthesia offers no protection to the brain cells against the effect of trauma, and that the lipoid solvent anaesthetics probably break the arc which maintains consciousness beyond the brain cells somewhere in the efferent path." They state that "the afferent path from the seat of injury being unbroken, the afferent stimuli reach and modify the brain cells as readily as if no anaesthetic had been given." These conclusions were based on histological examination of nerve cells, a method which is beset with difficulties in the way of arriving at positive conclusions, because of the great variation between individual cells under similar treatment.

Dr. W. B. Cannon suggested that we might obtain evidence bearing on this question by galvanometric recording of the action currents in afferent nerve paths in the decerebrate animal. This is the most direct method of attacking the problem. The action current is the most reliable proof of the passage of a nerve impulse; and the disappearance of action currents in the afferent tracts in the brain stem under anaesthesia would be dependable evidence of the cessation of sensory impulses.

A full account of our experiments with ether anaesthesia by this method has already appeared[2]. In the present paper we propose to give a somewhat condensed account of this work, and to add a brief statement of the results already obtained by the same method with intravenous injection of $MgCl_2$ (magnesium chloride).

The decerebrate cat is an ideal preparation with which to experiment on this problem. The brain stem being transected under deep anaesthesia, at the anterior edge of the anterior colliculi, the animal goes into a state of decerebrate rigidity, in which he lies still with limbs extended, the centres of consciousness gone, but the respiratory centre still functioning and maintaining life. Operative procedures and stimulation of sensory nerves may then be employed, with or without ether, without causing pain.

All sensory nerves from the limbs lead to the brain by a path consisting of a peripheral neurone which in every case connects with the central neurone at some point in the spinal cord or the medulla oblongata. These central neurones continue forward to a point beyond the plane of transection in the decerebrate preparation. They approach the cut surface of the brain stem in the medial fillet. With the cerebrum removed and the severed brain stem freely exposed, electrodes may be applied in such a way as to lead off action currents marking the progress of sensory nerve impulses in these neurones. Our problem, therefore, was to apply stimulating electrodes to a large peripheral nerve and record with a string galvanometer the disturbance set up in the neurones of the fillet, while the animal was free from ether anaesthesia; then to determine whether the response so obtained was modified by such ether anaesthesia as is used in surgery, and if so, the nature of the modification. In a preliminary research[3] it was shown that even when ether anaesthesia is pushed to the point of stopping respiration, peripheral nerve trunks will conduct impulses in response to stimulation and these will be marked as usual by action currents. When a nerve is exposed directly to ether vapour, the action current, or electric response, persists as long as the nerve is able to conduct impulses, judging from the response of the innervated muscle. The action current is probably an inseparable feature of the nerve impulse, and may be regarded as a sure criterion of function for the purposes of our problem.

Experimental Procedure. The animal is deeply etherized and then decerebrated by the Sherrington guillotine as already described in detail (reference 2, p. 115). The sciatic nerve was severed in the thigh and shielded, stimulating electrodes applied to the central end. Afferent impulses were evoked by single break shocks from a large inductorium. Non-polarizable leading-off electrodes were connected with the string galvanometer. We found that the best responses were obtained with one lead applied to the ventral edge of the cut surface of the brain stem a few millimeters from the median plane on the opposite side from the stimulated nerve, and the other lead applied to the posterior colliculus diagonally opposite, that is, on the same side as the stimulated nerve. After the animal had come well out of the ether under which he was decerebrated, the electric responses evoked by a series of single stimuli applied to the sciatic nerve were recorded. Ether was then given by means of a bottle connected with the tracheal cannula, and the responses to similar stimuli were recorded from time to time as the anaesthesia deepened. At the same time the presence or absence of reflexes (flexion reflex, corneal reflex, and pinna reflex) was noted. When deep surgical anaesthesia had been induced, usually about the time respiration began to show signs of impairment, ether was withdrawn, and a similar series of records was taken as the animal came out of anaesthesia.

Results. The typical response obtained by this method of recording consists in a small initial excursion of the string in the direction which signifies negative potential in the ventral electrode, occurring about 0.008 or 0.009 second after the stimulus, followed by a larger excursion in the same direction, which usually reaches its height about 0.026 second after the stimulus. By exposing the medulla oblongata and applying one electrode to its dorsal surface and the other electrode to the posterior colliculus and taking records on a high-speed film, using electron-tube amplification to magnify the excursions, we showed that the small initial excursion in the brain-stem records corresponded in time with the maximum excursion when the electric response was derived from the medulla. From this fact we concluded that the initial excursion represents the arrival of the impulses in the medulla, and probably depends on the extensive branching of the central end of the peripheral neurones just before they make connection with the central neurones there. The second excursion, which in the brain-stem records is the largest, is probably due to the impulses in the central neurones passing up into the fillet.

The effect of ether inhalation was to reduce or even abolish the second excursion (in the brain-stem records, the major excursion) while the initial excursion was scarcely affected at all. The amount of reduction of the second or major excursion varied somewhat with different preparations. In general an appreciable decrease began before either the corneal or the flexion reflex disappeared, these being the first reflexes to go. The pinna reflex usually lasted almost as long as respiration, and before this disappeared the galvanometric excursions were reduced to a small fraction of their normal value, or abolished altogether. This usually occurred in about five or six minutes. The maximum effect of the ether seemed to come about a minute after it was withdrawn. Then the excursions of the galvanometer became gradually larger and usually attained their original magnitude soon after the reappearance of the corneal and flexion reflexes.

Since peripheral nerve fibres are not appreciably affected by ether in such concentration as reaches them during general anaesthesia, it is reasonable to expect that the morphologically similar continuations of these fibres in the spinal cord will not be affected much either. Sherrington[4] advocated the view that ether acts on the synapses, or points of connection between neurones. On this view we should expect the impulses to continue under ether to traverse the peripheral neurones to the synapses, and there to encounter a block. In the central neurones passing up the fillet we should expect to find a reduction of activity. This is precisely what our experiments seem to show. The second excursion, which seems to be identified with the activity of the central neurones, is what becomes reduced almost to the point of vanishing under deep surgical anaesthesia.

Since Adrian[5] has established the "all-or-nothing" character of the nerve impulse, and in particular the fact that an impulse which is not quite extinguished in a region of impaired conductivity, regains its full size on emerging into a normal region in the nerve[6], we must conclude that the diminution of the galvanometer excursions does not mean a reduction in the size of individual nerve impulses, but rather a reduction in their number. At some of the synapses in the medulla and cord the impulses are probably completely blocked, while at others where the block is incomplete, the impulses pass through and regain their full size in the central neurones. From the great reduction in size of the galvanometric excursions we may conclude that under deep surgical anaesthesia very few of the central neurones still receive impulses on peripheral stimulation. It seems to follow that ether is effective in protecting the brain from such damage as it may suffer from sensory impulses.

The work of Meltzer[7] in which he demonstrated the power of $MgCl_2$ to produce general anaesthesia and the effect of $CaCl_2$ in neutralizing the action of $MgCl_2$, suggested that by means of these salts anaesthesia might be quickly induced and withdrawn, and might be conveniently controlled by means of the balance between magnesium and calcium. We have made a few experiments by our method of leading off action currents from the brain stem on decerebrate cats before and after intravenous injection of $MgCl_2$ and subseqent injection of $CaCl_2$.

In these experiments we have employed, besides the usual electrical stimulus, acoustic stimuli (*e.g.* the sound of a watchman's rattle) to produce sensory impulses. These regularly evoke action currents in the brain stem, and they obviate the electrical artefact coming from the induction shocks, which, in the case of electron tube amplification are sometimes confusing.

Although these experiments have not yet been extensive enough to warrant final judgment, they already suggest that $MgCl_2$ is a dangerous and unsatisfactory anaesthetic. In the first place a small increase in the dose beyond that which suffices to abolish reflexes, (about 0.15 gm. per kilo of body weight) is apt to cause a rather sudden paralysis of the respiration. In the second place our records seem to indicate that the reduction of afferent impulses is not quite as great in proportion to the abolition of reflexes as it is in the case of ether. This suggests that the action is relatively more on the motor side of the total chain of neurones and less on the sensory side, than in ether anaesthesia; but on this point we are not yet prepared to make a positive assertion. The only thing to be said for the magnesium anaesthesia is that $CaCl_2$, if injected before respiratory failure is complete, will completely restore the animal in a few seconds.

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ANAESTHESIA AND ANALGESIA IN LABOUR*

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"IN sorrow thou shalt bring forth children." The primal curse pronounced upon woman has never been revoked. Throughout all the ages childbirth and pain have been associated in men's minds. "Fear took hold upon them as of a woman in travail," says the Psalmist, and the solemn prayer of the *Litany* singles out the sorrows of the woman in labour.

From the dawn of antiquity men have sought to alleviate these sufferings but little was accomplished until the gift of anaesthesia was bestowed on a pain-filled world. It will ever remain one of the glories of the art of obstetrics that this priceless gift to humanity was so soon after its introduction employed to relieve the pangs of motherhood and that in the quest of something better than ether it was an obstetrician who found a new anaesthetic. On October 10th, 1846, in Boston, Morton demonstrated the anaesthetic properties of ether. Three months later in Edinburgh, Simpson used it to perform a version and an extraction. In November 1847 he discovered the pain relieving powers of chloroform which agent had been suggested to him for trial by Waldie, a Liverpool chemist, and thereafter used it in his practice in place of ether. There was much opposition both from medical and lay sources but the advantages were so great and manifest that the critics were stilled. It is said that when Simpson proposed the use of chloroform in Queen Victoria's confinement in 1853, the bishops voiced their dissent inasmuch as the Scriptures had decreed pain as the necessary accompaniment of childbirth. The Queen replied that none of the bishops had ever had a baby, but that she had passed through that experience and her experience should decide.

For three generations the rival claims of ether and chloroform engaged men's minds but within recent years two other agents have contested their supremacy. In 1880 Klikowitch, of St. Petersburg, proposed the use of nitrous oxide and oxygen in obstetric cases, but it was not until after 1913 that their use became general owing largely to the work of Guedel, Lynch, Hoag, and C. H. Davis. In 1902 V. Steinbuckel recommended the use of morphine and scopolamine in lobour and the method was popularized by Kronig and Gauss, of Freiburg, about 1913. Lately the use of these two drugs has attracted much attention particularly in the British Isles.

It would be foolish to deny that all opposition to the use of anaesthetics and analagesics has disappeared or that their introduction has been an unmixed good. The following disadvantages are still urged:

1.—The risks of anaesthetics, particularly chloroform, to the mother.

2.—The risks of anaesthetics and analgesics, particularly morphine, to the child.

3.—The increased necessity of interference.

These disadvantages are practically annulled if care and judgment are used. They are far outweighed by the advantages. These are threefold in character, humanitarian, obstetrical, and physiological. To many women the approach of childbirth seems like the entrance to the valley of the shadow of death and it is of untold value to them to be assured that their sufferings can be mercifully lightened. The obstetric advantages lie in the ability of the accoucheur to make a clearer diagnosis, to have a more manageable patient, and to be able to preserve a better surgical technique. The physiological advantages have been taught us by recent physiologists, particularly Crile, who has demonstrated the actual nerve changes produced by fear, suffering, and shock.

The point in the course of labour at which anaesthesia or analgesia should be induced has been much discussed. That point can never be determined in general but it should be determined in each particular case. Labours differ much in length and severity and the mental reactions of women to the approaching trial are as far asunder as the poles. The aim should be by prenatal care to bring the women to the approach of labour in as fit condition as possible and during labour to have the physiological forces utilized to the best advantage. Prenatal care insures to the patient a feeling of confidence in her medical attendant, and to the doctor, confidence also, since he is in the position of a general who has surveyed his battle ground and has pre-determined his strategy. In the first stage, if the patient has confidence in her doctor, if the nurse is competent, and if the lower bowel and bladder are thoroughly emptied, much of the nagging and disheartening character of the pains will disappear.

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In the second stage the voluntary powers should be utilized as far as possible and in many cases it is possible to withhold the anaesthetic until the head reaches the pelvic floor. At this time there is a decided advantage in the use of an anaesthetic.

In the third stage if lacerations have to be repaired or an adherent placenta removed, an anaesthetic should be given.

With all these generalizations there remains much scope for the exercise of judgment in the individual case. In the first stage, one woman will need only a few words of encouragement and the assurance that all is going well, another will be both physically and mentally benefitted by a dose of morphine and scopolamine. In the second stage analgesia may be sufficient in one case while in another surgical anaesthesia will be demanded.

The value of anaesthetic drugs being admitted, the choice of the particular agent must be considered. In this section of the continent chloroform is pre-eminently the anaesthetic of labour. Its merits are obvious. It is convenient in use, agreeable to the patient, and in the vast majority of cases, well tolerated. There is no doubt that the parturient woman enjoys an immunity from the risks of the drug. At the same time this immunity is only relative. Chloroform has been known to produce changes in the liver analogous to those produced in eclampsia and its use is, therefore, contra-indicated in toxaemic states. Further, as it is a depressant it should not be used where any prolonged operation, or one involving shock, is to be undertaken. Munro Kerr insists that chloroform favours post partum haemorrhage, very decidedly so, if the administration has been continued for any length of time and surgical anaesthesia has been induced.

Ether is less convenient, and less agreeable, it is irritating to the bronchi and kidneys and is more difficult to employ as an analgesic. On the other hand it is superior to chloroform where surgical anaesthesia has to be maintained for more than a few minutes. It may be advantageously combined with oxygen in many cases.

The value of morphine or some opium derivative, combined with scopolamine, hyoscine or atropine is generally admitted, during the first stage in certain cases. Their value in the second stage has been the subject of much controversy. Without going fully into this vexed question, I may say that their use calls for constant watchfulness on the part of either the doctor or of a nurse with special training in their use and generally presupposes that the patient is in a hospital. These restrictions tend to limit their field of admitted usefulness.

The nitrous oxide oxygen method has its enthusiastic advocates. These claim that the physiological forces are better utilized, that analgesia is a matter of only seconds, that the co-operation of the patient can be better secured and hence labour is actually shortened, and that shock is lessened on account of the rapid elimination of the drug and the more transient tissue changes. Others, however, state that the use of nitrous oxide is only comparatively safe, that it raises blood pressure and hence that it is contra-indicated in cases of high blood pressure, toxaemia, and cardiac disease. They point out that the apparatus is cumbersome and the cost of the gas high. While there is so much force in these objections that nitrous oxide and oxygen are never likely to be used in all cases, yet the method is of real value. I have used a Clark portable apparatus in a number of cases and have found it to work most satisfactorily. In the average case the cost of the gas does not exceed two or three dollars. My aim in these cases when the gas was used was to secure analgesia not anaesthesia so that the patient was relieved of pain, but remained conscious and was able to co-operate. In practically all this aim was reached. A striking feature was the regularity of the pains and the way in which patients responded to suggestion. In some cases surgical anaesthesia with ether or chloroform at the close of the second stage was used. In several cases, however, complete and satisfactory anaesthesia which allowed forceps operations to be done was obtained. In some cases the baby was delivered by the natural forces where it seemed that with other anaesthetics intervention would have been necessary. The condition of mothers and babies after the use of nitrous oxide and oxygen was all that could be desired.

Special anaesthesia has been employed in cases of labour complicated with terminal valvular disease, advanced tuberculosis, bronchitis, and pneumonia with satisfactory results, but it is never likely to come into general use.

Conclusions

1.—The use of substances to relieve pain has been of untold benefit alike to doctor and patient.

2.—Each individual case must be studied not only during, but also before, labour.

3.—Each of the drugs mentioned has its special advantages and disadvantages and no one drug should be used in obstetric practice to the exclusion of all others.

PRESIDENTIAL ADDRESS
PRINCE EDWARD ISLAND MEDICAL SOCIETY ANNUAL MEETING.

J. A. MacPhee, B.A., M.D.

Summerside

I MUST first express my deep appreciation of the honour of presiding at this, the thirty-fifth annual meeting of the Prince Edward Island Medical Society, at the same time admitting that there are many more worthy of this honour and more capable than I am of fulfilling the duties of this position.

The annual meeting of the Provincial Medical Society is an event to which every practicing physician in the province should look forward and at which he should be present if possible. The meeting may be taken as a criterion of the medical men of the province, for a meeting well attented, in which the members evince their interest by the attention paid to the various items of the programme and by participating in the discussions, will reflect credit and show that they are wide awake and striving to keep abreast of the times. The getting together at meetings of this kind, the renewing of acquaintances, the comparing of notes with one another and listening to the papers and discussions cannot fail of making a man's outlook broader and adding to the sum of his knowledge. Our annual meetings should be more largely attended; only a day is taken up and now thanks to the motor car one can come from any part of tho province and return the same day. By increased membership and better attendance at the meetings, our Society shall grow and flourish and be doubly useful to its members.

Modern medicine is becoming more and more associated with preventive medicine so that at the present time the prevention of disease rather than its treatment looms larger and larger in the medical mind. The trend of medical practice at the present day is, following the old adage "An ounce of prevention is worth a pound of cure."

It may seem anomalous that the medical profession, which is so much concerned with the treatment of the sick from whom it draws its emolument, should be waging an unceasing warfare against disease, bending every effort towards its prevention and eradication; but it is nevertheless true, and this shows the altruism of the profession—that its aims are not selfish but, on the contrary, are directed towards the common good. In the last fifty years preventive medicine has, with the discovery of the causes of the serious epidemic diseases steadily advanced to a position of great importance, so that from a blundering art it has become a science.

In connection with the development of preventive medicine, the names of Pasteur, Jenner, Koch, and Lister will always illumine the pages of medical history for their great contributions to the science of medicine towards the prevention of disease, the amelioration of human suffering, and the saving of human life. The late Sir William Osler, towards the close of his illustrious career especially, was a great exponent of preventive medicine. He held that the future of medical practice lay in the preservation of health, in the prevention of disease, and said in one of his addresses, "No longer is our highest aim to cure but to prevent disease."

Marvellous things have been done by sanitary science in recent years towards the prevention of diseases which formerly exacted a fearful toll from the areas which they ravaged. The conquest of yellow fever and malaria in the tropics making them fit for the white man to live in is one of the most brilliant achievements of preventive medicine. At Havana, yellow fever was stamped out by an anti-mosquito compaign in a single year, and in Panama, General Gorgas eliminated yellow fever completely and reduced the incidence of malaria from 81.9 per 100 employees in 1906 to 1.5 per 100 employees in 1916, thus making possible the construction of the Panama Canal with a very small loss of life by disease and in this way much shortening the construction period. The sanitary measures which brought about the changed conditions in these areas were measures aimed at the destruction of the mosquito and its breeding places, and the draining of the infected areas.

The general reduction in the incidence of typhoid fever in this country as a whole and its lessened death-rate is another brilliant achievement of preventive medicine. This has been effected by various sanitary measures:—the purification of water supplies, the care of excreta, the supervision of the milk supply and pasteurization of milk, the sanitation of food supplies, the control of typhoid patients and carriers, and preventive inoculation.

Typhoid fever in former wars was the scourge of armies in the field. In the British Army during the World War there was almost an entire absence of typhoid on account of protective inoculation of the troops against this disease. This method of prophylaxis should be made use of more in civilian practice for the protection of nurses and attendants in typhoid cases, the other members of the household from which the patient comes, and all who are in any way exposed to contagion.

One would expect with our present day knowledge of typhoid and the means at our disposal for its prevention, that serious epidemics of this disease were a thing of the past, but it is only by eternal vigilance that the disease can be kept in the background to which it has been relegated on this continent. The water supply which is the chief medium through which the infection gains entrance into a community must be jealously guarded; if it is considered safe it must be kept safe and if doubtful it must be rendered safe by chlorination.

Since the beginning of the present year there were two serious epidemics of typhoid in Canada, one in Ontario in the town of Cochrane, the other in the Province of Quebec in the town of Mansonville. In the case of Cochrane the cause of the epidemic has been shown to be a polluted water supply. The town water supply was derived from springs which were inadequate for its requirements so that an auxiliary supply from a lake was requisitioned. The water in this lake was several feet higher than that in a chain of lakes which received the sewage of the town and communicated with one of them. Owing to the dry season last fall and the heavy demand on the auxiliary supply, the level of the lake became lower than that in the sewage receiving lakes, so that the water supply became polluted. The Town Council was forewarned by the Provincial Health authorities of the danger threatening the water supply and was advised to take measures to improve the same and guard against its contamination, but unfortunately the warning was not heeded nor the advice taken, and we see with what disastrous results. In the case of the epidemic at Mansonville, the source of the pollution of the water supply was traced to a typhoid house from which sewage flowed into a brook that entered the reservoir from which the town derived its water supply.

The lesson to be learned from these two epidemics is that we should not be over-confident but ever on our guard against typhoid, for no matter how ideal a water supply may be, there is always the possibility that infection may enter from some occult source. In this province whilst we have had no serious outbreaks of typhoid, still each fall there are small local epidemics, or sporadic cases, mostly in the rural communities.

The medical man attending a typhoid case does not do his whole duty if he merely treats the patient, he must endeavour to get at the source of the infection and adopt all the prophylactic measures at his command in order to avoid the spread of the disease.

Tuberculosis is the most universally distributed of all the communicable diseases that affect the human race, and its ravages even extend to the animal kingdom from which it is conveyed to man in a variety of ways. Notwithstanding the warfare that is continually being waged against this dread disease it is still all too prevalent and deadly, although there has been everywhere a marked decrease in the incidence and death-rate. This decrease is accounted for by our increased knowledge of the disease, education of the public, improved sanitary conditions, and the establishment of sanitaria and dispensaries.

The tuberculosis problem is one which vitally concerns us in this province. The last report of the Canadian Tuberculosis Society contains something that should give us pause—*according to this report our province has the highest death-rate from tuberculosis of any province in Canada, the rate being given as 143 per 100,000.* This is a matter of surprise to us when we reflect that here, we have no crowding, no very poor, no slums, no sweat shops— in a word none of the conditions which would act as predisposing factors in the causation of the disease. On the other hand we have large open spaces, an equable climate, and being mainly an agricultural community, the chief occupation is farming, than which there is no more healthful occupation. There is another item in this report which is astounding—total sanitarium beds available for tuberculosis, nil. Does it not seem anomalous that the province which has the highest death rate from tuberculosis should have no facilities for sanitarium treatment? The lack of this accounts, in great measure, for our unenviable record as regards the disease, for although we have our Anti-Tuberculosis Societies and the Charlottetown Dispensary, all doing excellent work, yet we are handicapped in the fight on account of the lack of a sanitarium.

Some years ago one of our successful Islanders at home, Sir Charles Dalton, who had prospered and become wealthy in an industry in which he was one of the pioneers, knowing the ravages of this scourge by sad experience in his own family and wishing to use part of his wealth towards helping his fellow man, made an offer to the Provincial Government to build and equip a sanitarium and hand it over to the Government to be run as a Provincial Institution for the treatment of tuberculosis. This offer was gratefully accepted by the Government in office at the time and the construction of a sanitarium, to be called the Dalton Sanitarium with a capacity of about 30 beds, was proceeded with. When the building was completed the Great War was on and it was taken over by the Invalid Soldiers Commission for the treatment of invalided soldiers. Quite extensive additions were made to increase the accommodation so that before the close of the War it had become quite a large institution. Some time after the War ended, the Department of Soldiers Civil Re-establishment closed the institution and handed it back to the Provincial Government. The Government in office at that time did not see fit to operate the sanitarium, either in whole or in part, so that this munificent gift from a generous donor was rendered ineffective. There has been a breach of faith with the philanthropist who out of the goodness of his heart built and founded the sanitarium, and with the sick and needy who were destined to reap its benefits. It is the clear duty of the medical profession of this province to see that some adequate provision is made for the treatment of tuberculosis if the stigma at present on the province is to be removed, and it is only by organized and concerted effort that this can be done.

The Red Cross Society conducted a medical examination of the children of our public schools in 1921 and 1922 and whilst the survey was not complete, the results were surprising if not alarming. In the 1911 survey, which covered 20 schools, 93.8 per cent of the pupils had defects of some kind, in the 1922 survey 119 schools were covered and 88.2 per cent. had defects other than teeth. This is indeed a revelation, and when we consider that all or nearly all of these defects are preventable, we must conclude that measures should be taken at once to improve the health of our young boys and girls, if we would have them enter the battle of life unhandicapped. In connection with the medical examination of the pupils in the school at which I assisted, I was struck with the large number of pupils who were unvaccinated. No child should be admitted to school who has not been successfully vaccinated; if this rule is not enforced, some day we will have an epidemic of smallpox and the result will be disastrous. The medical survey made by the Red Cross has demonstrated the utility of medical inspection in the schools. The conservation of the health of our boys and girls is of vital importance and will require the best knowledge and skill of preventive medicine.

A system of medical inspection of schools is absolutely necessary in this province. Governments are notoriously slow in adopting public health measures and the co-operation of the medical profession and the public is necessary to bring about any material changes. Our government gives much care to the health of foxes, horses, cows, sheep, and hogs and spends a good deal of money annually in connection with this work. All this is quite commendable, but how little attention is paid to the health of our young children, the young men and young women of the future!

If we would make any advance in matters pertaining to public health and preventive medicine, we must have a more organized profession, we must have a unity of purpose in our aims and endeavours, and in this way when we approach the Government on any matters of a medical nature, our voice will be that of a united profession, not as "the voice of one crying in the wilderness." A Department of Health is necessary in this province, and until such is instituted, the introduction of many public health measures long overdue, is likely to be long deferred.

Among our problems is a matter which requires immediate attention, and that is the matter of fees paid to medical men for services in connection with coroner's inquests. The fees for such work are laid down in a very old statute and are totally inadequate at the present day. The necessity for the revision of this statute is quite evident, but naturally nothing will be done about it until the medical profession takes the matter up and makes its recommendations. To get more than the pittance allowed by that ante-deluvian statute, one would have to depend on the integrity and fair-mindedness of Government executive officers, some of whom are lacking in these qualities.

The outstanding event in the medical world during the past year has been the discovery by Dr. F. G. Banting of Toronto University, of insulin, a new treatment for diabetes. This treatment which has been rigidly tested has given wonderful results and has been accorded world-wide recognition. Diabetes mellitus is deficiency of the internal secretion of the Islands of Langerhans of the pancreas, causing disordered carbohydrate metabolism. Insulin is an alcoholic extract of the internal secretion of the pancreas and causes marked reduction of sugar in the blood and in the urine. The chief source of insulin at present it from the pancreas of certain fishes.

The treatment is not yet available for general use by the profession on account of the difficulties attending its administration. The dosage in each case must be determined experimentally. The patient is placed on a diabetic diet, each article being carefully weighed, the amount of proteid, carbohydrate and fat estimated and also the number of calories. The administration of the drug must be checked step by step by the estimation of the blood sugar, so at present cases should be sent to one of the larger hospitals having a metabolism department where full facilities for carrying out the treatment are afforded. The insulin treatment does not supplant the dietetic treatment of diabetes, but is used in conjunction with it. It is not indicated in cases which will get along well under the regular treatment carried on in the metabolism clinics of the larger hospitals. It is specially indicated and is almost a specific in cases that are going bad and seem hopeless, in which acidosis is marked and coma present, and the results have been marvellous. After receiving the treatment the patient has to continue dieting and have blood sugar estimations and urine tests from time to time.

The discovery of insulin is without doubt the most brilliant achievement in the science of medicine in recent years. Already many lives have been saved by its use, and that the discoverer is a Canadian doctor is something for us to be proud of.

The trend of medical practice to-day is towards preventive medicine, and owing to this, changes have been brought about in the relations between the public health official and the private practitioner, bringing them into closer contact and co-ordinating their efforts in the pursuit of a common aim and a common purpose. Great as the achievements of preventive medicine have been in the past, we look forward to still greater achievements in the future.

DIAGNOSIS OF DISEASES OF THE STOMACH AND DUODENUM*

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In considering diseases of the stomach one feels it desirable first of all to emphasize the danger which follows from a loose acceptance by the public of a symptom, namely, indigestion, as a form of disease. It is quite unnecessary for me to tell this audience that there is no disease known as "indigestion," but I should like to point out in the strongest terms possible the dangers that have followed from permitting the public to believe that there is a *disease* known as "acute indigestion." I have never seen or known of a case of "acute indigestion" in the twenty-five years in which I have been actively engaged in the practice of surgery. I have met with many cases of acute appendicitis, perforation of a duodenal or gastric ulcer, and other acute abdominal conditions which have been wrongly considered as cases of "acute indigestion," and because of this mistake on the part of the relatives of such patients, delay in seeking medical advice has occurred until a serious condition of the patient has developed, making successful operation impossible; and in this way many valuable lives have been lost which could have been saved by an early recognition of the condition and surgical intervention. The public are altogether too prone to seek a cause for serious gastric or other abdominal troubles in some supposed error in diet, either the quantity or the quality of the food; and one cannot too strongly condemn this habit. It is the duty of the medical profession to educate the public against the danger which they run in attempting to diagnose acute illnesses. This, to my mind, is quite as important, if not more so, than the educative campaign carried on by the Society for the Control of Cancer. In these acute conditions, if physicians have the opportunity of diagnosing them within a few hours of their beginning, and surgical aid is supplied, the vast majority will recover promptly.

The most important diseases of the stomach that we have to consider are ulcer and cancer. When we realize that one-third of the cancers occurring in men are found in the stomach, and slightly more than one-fifth of the cancers in women, the importance of this disease becomes apparent.

Practically all surgeons, clinicians, and pathologists now agree that cancer may develop upon ulcer, and only the frequency of such development is in controversy; in other words, every gastric ulcer is a potential cancer. The exact starting point of cancer of the stomach is unknown, but early cancers of this organ have been seen in the mucosa of the borders of chronic ulcers. C. H. Mayo believes that more than one in six is thus developed.

Williams states that 60% of the cancers of the stomach occur at the pylorus, where only 12% of ulcers occur. Welch reports 36.5% of ulcers just above the pylorus, where 12% of cancers occur. In considering the influence of environment, practically five ulcers occur in the acid-reducing first portion of the duodenum to one in the stomach. The duodenum is resistent to cancer.

It is essential for the surgeon to be familiar with the diagnosis of gastric disorders in order to recognize the cases which come within his domain. Recent developments in gastric roentgenology have rendered this task much easier. However, if grave errors are to be avoided he must not allow the x-ray to displace other methods of diagnosis, such as a carefully elicited history (often the most important of all), a thorough local and general bedside examination, and a chemical examination of the stomach contents.

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*Read before the Ontario Medical Association at Windsor, Ont., June, 1923, as part of a Symposium.

May I here illustrate what I mean by the unwisdom of depending upon a mechanical method of diagnosis alone?

Four years ago I was asked to see a patient (Case I.) under the following circumstances. A woman, aged 45, had consulted a recent graduate because of feeling a little run down. In order to be thorough, and believing it was impossible to make a diagnosis without the assistance of the x-ray, and although she gave no symptoms whatever referable to her stomach or her gastro-intestinal tract, he had a complete gastro-intestinal x-ray examination made. The x-ray report stated that there was a persistent notch along the lesser curvature which indicated a defect, and the diagnosis was made of carcinoma of the stomach. He referred her to a surgeon, who accepted this diagnosis without further examination, and an operation was arranged for. Her husband, who was travelling in the west, was telegraphed for, and upon his arrival he asked for a further opinion on the x-ray findings, and I was requested to examine the plates. I declined to make a diagnosis on the x-ray findings without examining the patient. When I saw the patient I found her to be a well-nourished woman, weighing 150 lbs., who gave me no history whatever of any symptoms referable to her stomach; nor on examination could I find anything to indicate disease of her stomach or anywhere else. I had no hesitation in giving a positive opinion that she had not cancer of the stomach, and consequently the operation, which was arranged for the following day, was indefinitely postponed. I saw this woman two years afterwards, when she was in excellent health; and curiously enough I was called to see her about a month ago for an acute abdominal condition, due to a torsion of the right tube, which necessitated opening her abdomen. After removing the diseased tube I took the opportunity of examining the stomach, when it was found to be quite normal.

The interpretation of skiagrams of the gastro-intestinal canal requires considerable practice, and should be best done by the surgeon, who has the advantage of being able to check up the x-ray findings with the actual condition found at operation.

In arriving at a diagnosis of any surgical condition of the stomach or duodenum a definite system of examination should be carried out. There should be no difficulty in recognizing that a patient suffering from localized pain in the epigastrium, which came on immediately after taking food, and radiated to the back, with a history of having vomited arterial blood, and with a filling defect on x-ray examination, had a gastric ulcer. Or again, loss of appetite, loss of weight, anaemia, some distress in the stomach after taking food, an irregular mass in the region of the pylorus, which the x-ray shows encroaching on the lumen of the stomach, coming in a patient who had always enjoyed good digestion, are significant of cancer. These are typical pictures of surgical lesions, but unfortunately they do not always present themselves in this typical fashion, and in order to avoid errors in diagnosis we should pay special attention in the history to such complaints as *pain*, *motor disturbance* and *bleeding*.

Loss of appetite is primarily a constitutional symptom and as such its frequent occurrence in cancer is explained. It has little value in differentiation.

1.—*Pain*, when persistent, with indefinite onset and fairly long duration, points to cancer. The intermittent pain in the epigastrium occurring at some definite time of day and tending to radiate to the left side of the back or shoulder is indicative of ulcer. If the pain occurs in the first half of the digestive period the ulcer is usually in the stomach itself. If in the second half (hunger pain), the ulcer is situated in the neighbourhood of the pylorus or in the duodenum. In the latter case the evening meal is often followed by pain in the middle of the night. We must not, however, jump to the conclusion that hunger pain always means duodenal ulcer, because it has been shown that it may occur without the slightest trace of ulcer. In ulcer of the stomach pain on pressure is usually on the left and radiates towards the left side of the back and left shoulder, whereas the position of duodenal pain is more towards the right.

Sudden, violent pain in the epigastrium usually means perforation. There is no pain so severe as that of perforation of a gastric or a duodenal ulcer. This pain makes the patient rigid, and he lies very quiet, with legs drawn up in an attempt to relax the muscles. There is no other acute abdominal condition besides perforation of a gastric or duodenal ulcer which makes a strong man so completely and suddenly *hors de combat*. De Quervain says that if there is any doubt about the diagnosis, if the patient has asked for an alcoholic stimulant immediately after the onset of the pain that this will settle it, because this is never done in cases of other acute inflammatory diseases of the abdomen, such as appendicitis, cholecystitis, etc., and it is because of the feeling of intense prostration. There is hardly any disease of the abdomen which has not been confused with perforated gastric ulcer, especially cholecystitis, pancreatitis, rupture of a pregnant tube, torsion of an ovarian tumor, and acute obstruction. Case 2, related at length later, deals with some phases of a perforated duodenal ulcer.

In colic the pain makes the patient restless. In acute pancreatic necrosis pain in the back is a common symptom. Reflex pain may entirely mislead one from the site of the lesion. Case 3 illustrates this. See also cases 4 and 5. Reflex pain may also constitute a complication of an already recognized gastric lesion. This was found in case 6.

2.—*Motor Disturbances.* Painful distention of the stomach after meals, visible peristalsis in the stomach and the occasional vomiting of large quantities are evidences of a narrowing of the pylorus. A classical sign of retention vomiting is the expulsion of large amounts of food residue taken one, two or more days previously, in a more or less fermenting condition. This may be purely functional or due to ulceration with spasm. It may be caused by cicatricial stenosis. Vomiting directly after meals may be due to cancer or to an hour-glass condition secondary to a stenosing ulcer high up in the fundus, as was found in case 6. Hysterical vomiting must be excluded. Vomiting from dilatation of the esophagus just above the cardiac orifice of the stomach should never be mistaken for true vomiting. If we know that stenosis is present, inquiry into the history may reveal a long duration of stomach trouble indicating ulcer. The importance of ascertaining the previous history is emphasized by case 7.

While stenosis is the usual cause of a dilated, prolapsed stomach, we must recognize that in some displacements of the stomach, even though the greater curvature is as low as the symphysis, it does not necessarily follow that the case is a surgical one. A displaced stomach will often discharge its functions quite normally, and if there are symptoms they will probably be due to the uneven muscular power rather than to the mechanical circumstance of the gastroptosis.

It is impossible to decide whether or not cancer may be developing in the scar or in the still existing ulcer in old standing cases. Hardly 2% of ulcers, diagnosed clinically, undergo cancerous degeneration. Such a change is suspected when the symptoms of an old ulcer become rapidly worse, especially the stenosis and presence of blood in the stools. A large, rapidly-forming tumour in the upper abdomen, with fruitless efforts at vomiting, should suggest a volvulus of the stomach. This condition has often been found, but has never been diagnosed.

3.—*Bleeding.* True arterial haemorrhage is the best evidence of ulceration, and should not be confounded with varicosity due to cirrhosis of the liver or tuberculosis of the lung. It is, however, not an infallible sign, as is shown in cases 8 and 9.

"Coffee-ground" vomitus means a fairly late stage of cancer. When melæna occurs it must not be confused with bismuth darkening of the stools.

So much for the consideration of the history. When we proceed to the bedside examination inspection may reveal pallor and the haemoglobin may be below 50%. This would point towards ulcer or cancer. Palpation of the abdomen may reveal a tumour in the pyloric region. If its contour can be made out, an irregularity suggests cancer, while an even cone-shaped mass with base to the left suggests an inflammatory condition due to an old indolent ulcer. Such an inflammatory thickening usually does not exceed a hen's egg in size, but occasionally it may be larger, as was found in case 10.

A tumour felt along the greater curvature to the left of the middle line is most likely to be a cancer. The connection of a tumour with the stomach is indicated by the fact that it can be moved around the segment of a circle, the centre of which corresponds with the position of the pylorus. The absence of evidence on palpation does not exclude ulcer or cancer. A tumour which is strikingly movable and lacks accompanying symptoms would make one think of a foreign body, such as a hair tumour. Figure I. illustrates such a tumour which I removed from a young woman, twenty-five years of age.

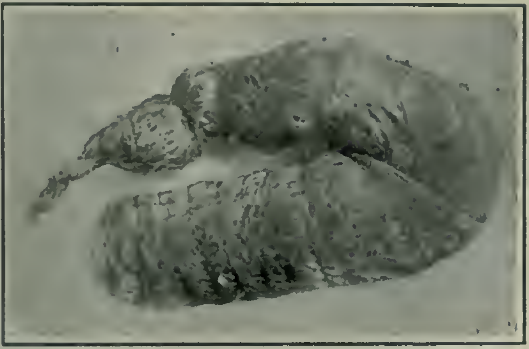

FIG. I.
Hair tumour removed from stomach.

In the further examination of the patient by the numerous clinical methods of testing the gastric mobility and the chemical examination of the secretions, it is too often found that their complexity is very much greater than their clinical value. They have almost entirely given way in favour of the x-ray. The x-ray is extremely helpful, but it cannot be relied upon alone as positive evidence. Especially may this be the case in the lower part of the duodenum, as happened in case 11.

Chemical tests. (1) A high hydrochloric acid content supports the diagnosis of ulcer. it may rarely occur in carcinoma.

(2) The absence of free hydrochloric acid and the presence of lactic acid supports the diagnosis of carcinoma.

(3) The presence of blood usually indicates ulceration, but it is indispensable in doubtful cases that the stools be examined repeatedly for chemical traces of blood, after two days' abstinence from meat diet. The more constantly blood is detected in the stool the more suggestive of cancer is the case, because the admixture with blood is very irregular in cases of ulcer.

Case 2.—Slobod. First seen in consultation with his doctor in September, 1921, when I made a diagnosis of perforated duodenal ulcer, confirmed by operation the following day, at the Toronto General Hospital, when the perforation was closed and drainage instituted. He had been in the medical department of the Toronto General Hospital under observation for some time immediately preceding this, and had had x-rays made of his stomach, duodenum and gall bladder, when a diagnosis of gall stones was made from the x-ray findings. In closing the perforation considerable narrowing of the duodenum resulted, which I felt at the time might necessitate a gastro-enterostomy later. His condition then was too serious to justify such a procedure. Following his operation he developed pneumonia, and was very ill for two or three weeks. A few months later he was still complaining of gastric trouble, and I recommended a gastro-enterostomy, which was performed on March 2, 1922, from which he made a good recovery. However, he returned in October, 1922, complaining of pain in the epigastric region. I sent him to the Toronto General Hospital for x-rays, and the radiologist reported that all the food was passing through the artificial stoma; that the stoma was not filling well; that the pylorus filled well and that the caput never filled. His diagnosis was, "Negative for gastric carcinoma and ulcer. The portion of the bowel adjacent to the enterostomy is not normal and has the appearance of being held by adhesions." I advised further operation, which was done on May 3, 1923.

On opening the abdomen I found the jejunum immediately distal to the gastro-jejunostomy held firmly in contact with the transverse colon and adherent to it. This adhesion was about 2 inches from the stoma. On careful examination I found an excavated ulcer on the jejunum, which did not appear to penetrate the transverse colon. The jejunum was separated from the transverse colon, when a large, punched-out ulcer, as large as one's index finger, was disclosed. This was sutured, and the adhesions about it separated.

He made a good recovery from this.

Case 3.—Mr. J. B. Aet 42. He was admitted to a medical division of the Toronto General Hospital with a diagnosis of "angina pectoris." The very typical pain constituted his main symptom, while the complaint of "indigestion," *i.e.* slight abdominal discomfort, belching of gas and occasional vomiting, occupied such a minor place in his thought as to be only brought out by close questioning. The x-ray revealed a large ulcer on the lesser curvature of the stomach, and he was transferred to my service, where a posterior gastro-enterostomy was done, giving complete relief to the pain and other symptoms. The ulcer was glued to the under surface of the left lobe of the liver.

Case 4.—Mrs. D. Aet 68. First seen by her doctor about one week before laparotomy. She had been complaining for six or eight months of lassitude, some indigestion and pain in the precordial region, and had been treated by hypodermic injections for artero-sclerosis and angina for at least four months. Previous to this she had complained of very little indigestion and no abdominal pain; she had lost no weight, but showed a marked secondary anaemia. At the time when patient was first seen no tumour could be felt, but a sense of fullness in the epigastrium was manifest. x-ray showed pyloric stenosis with dilatation. *Diagnosis*—Carcinoma of pylorus.

At operation a very large mass was found surrounding the pyloric end of the stomach, quite 3 inches in transverse extent, clearly carcinoma. There was also a distinct secondary growth in the omentum, which was enormously enlarged. A posterior gastro-enterostomy was done with great difficulty on account of the enormous omentum and the stoutness of the patient, and the fixity of a portion of the stomach. She made a good recovery and had at least four months of comfort before her symptoms again became distressing, ending fatally at the end of six months.

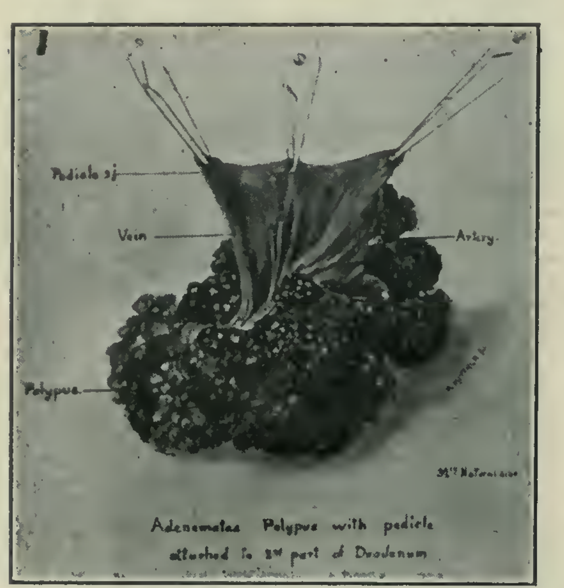
Pedicle
Vein
Artery.
Polypus.
¾ Natural size
Adenomatous Polypus with pedicle
attached to 2nd part of Duodenum

Fig. II.
Case XI.—Drawing of Tumour.

Case 5.—Mr. H. W. Aet 62. Gave a history of some gastric disturbance for a period of eight or ten years. Was taken with severe pain below the ribs on the right side, for which a hypodermic of morphine was given. This pain continued from 9 o'clock at night until I saw him the following morning at 11 o'clock. By that time he had had altogether 1½ grs. morphine, and he was sitting up in bed with an anxious expression; the muscles of his abdomen were rigid, and he was still suffering agonizing pain, which he referred to the upper part of his abdomen. He was sitting absolutely rigid, the slightest movement increasing the pain. He had been told many years ago that he had gall stones, and assumed that the recurring attacks of pain from which he suffered were due to this cause.

It was quite clear from the appearance of the patient as given above that he was suffering from perforation of the duodenum or stomach. He was moved to the hospital, when a large duodenal perforation was found and closed. Subsequently a subphrenic abscess developed, which was drained, and six weeks after operation, when he seemed to be well on the way to recovery, he died suddenly from a pulmonary embolism.

Case 6.—Miss C. S. Aet 35. This patient came under my care recently for the relief of an hour-glass stomach. She could take very little food, and this was always vomited almost immediately unless it was fluid in character. She complained of an agonizing referred pain in the shoulder and back, and as the ulcer involved almost the entire circumference of the upper third of the stomach and was glued to the under surface of the left lobe of the liver, with a large excavation of its substance, the cause of the pain may have been either an involvement of the vagus or the phrenic, or a combination of the two. The stomach could not be separated from the liver in this case, and to relieve the obstruction a gastro-gastrostomy was done. Her general condition was greatly improved, but the referred pain was not relieved, but could be controlled by medication directed to the surface of the ulcer.

Case 7. A Russian, 28 years of age, who could not speak English, was admitted to the medical division of the Toronto General Hospital several years ago, when the diagnosis lay between an acute appendix, gall bladder or duodenal or gastric ulcer was made, and he was transferred to my service for operation. He was suffering intensely with pain in the epigastrium, vomiting repeatedly large quantities of dark brown fluid, in spite of the fact that none had been taken by mouth, and with a visible peristaltic wave passing from left to right across the epigastrium about every two minutes. It was now clearly pyloric obstruction, and as the vomiting did not relieve him, one of my assistants opened his abdomen, and finding an enormously distended stomach with thickened walls and complete obstruction at the pylorus, performed a posterior gastro-enterostomy, giving complete relief. The sudden severity of his symptoms was most unusual in a case of pyloric obstruction gradually developing during four years. A subnormal temperature and the vomiting of large quantities of dark brown fluid—as much as 80 ounces in four hours, none of which had been taken by mouth—suggested an obstruction lower down the intestinal tract. The origin of this fluid reveals a most interesting fact, *viz.* that an abnormally distended stomach, completely obstructed at the pylorus, preventing any regurgitation from the duodenum, with oedematous and congested walls, is capable of secreting fluids at the rate of an ounce in three minutes. When such an outpouring of the fluids of the body can occur from the stomach alone, one can readily understand the gravity and extent of obstructive lesions lower down in the intestinal tract, and an explanation for the grave symptoms which occur secondarily to the depletion of the body fluids.

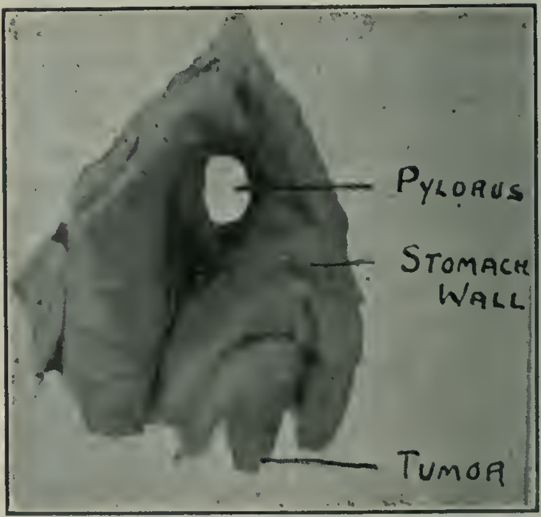

Fig. III.
Case 8.—Photo of Stomach Tumour.

Case 8.—Mr. A. T. R. Aet 60. A severe haemorrhage (said to be about 1 quart), which caused him to collapse, occurred quite suddenly one evening. He was so exsanguinated that a blood transfusion was performed on him the next morning. He made a good recovery from this, and three weeks later, after another transfusion of blood, the abdomen was opened, when a hard lump was felt at the pyloric end of the stomach. This lump was on the anterior wall, about 1 inch from the pyloric ring, its base seemed to be about 1½ inches in diameter, and it projected into the stomach to the extent of about 1½ inches. A posterior gastro-enterostomy was first done, and was followed two weeks later by a pylorectomy. The tumour at the time was thought to be malignant, but on microscopic examination was reported by the pathologist to be a fibroma. I have had this specimen re-examined by another pathologist, who reports that it is a haem-angio-endothelioma. There are numerous young blood vessels seen, with whorl formation of spindle cells, plasma and lymphocytic infiltration.

This is such an unusual case that I think it worth while to give some further details. The patient had symptoms of "indigestion" for ten years. For the last few months he had attacks of severe abdominal pain in the epigastric region, usually relieved by vomiting. (This was explained after the operation by the character of the growth, which was situated near the pylorus, permitting it to act like a ball-valve and block the pylorus—figure 3.) His condition was complicated by the fact that he had had a small renal stone two years previously, which gave a great deal of pain until passed. X-ray report stated, stomach examination negative for gastric ulcer or gastric cancer, but the duodenum showed a suspicious puckering which was suggestive of duodenal ulcer. It may be of interest here to note that this patient was treated in New York by what was called "gastric massage." As far as I can learn this consisted in passing a rubber tube into the stomach and inflating the stomach with air. This treatment preceded the gastric haemorrhage by a few weeks. The patient is now in excellent condition, over four years since operation.

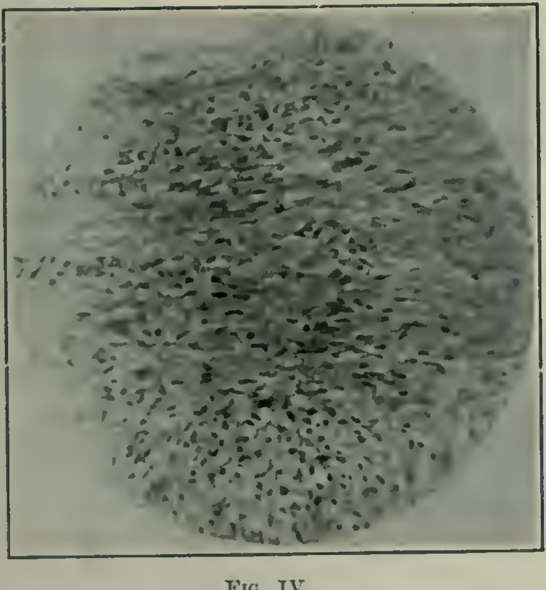

FIG. IV.

CASE 8.—Photomicrograph of Stomach Tumour.

Case 9.—Mr. G. Y. Aet 47. I recently had a patient sent into hospital from a neighbouring town the day following a very severe gastric haemorrhage, in which he was said to have lost a quart of blood. He gave a history of having had attacks of abdominal pain for some years at intervals of a few months, and three years ago had a severe gastric haemorrhage following an attack of influenza. He had had attacks of haematemesis at long intervals. During the last three months he complained of great muscular weakness. His red blood count showed secondary anaemia, and a diagnosis was made of pyloric cancer. When admitted to the hospital he was in a very critical condition, but picked up somewhat after a transfusion. However, three days later he again commenced to vomit what appeared to be pure blood, filling

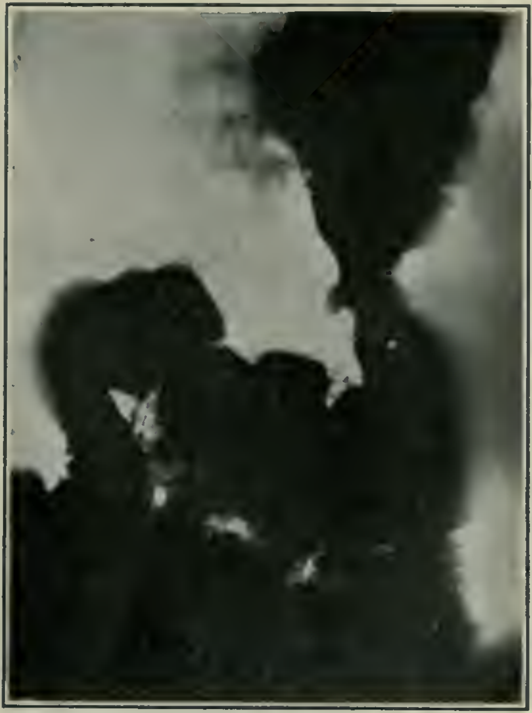

FIG. V.

X-ray photo of Ulcer of Stomach causing Hour-Glass constriction.

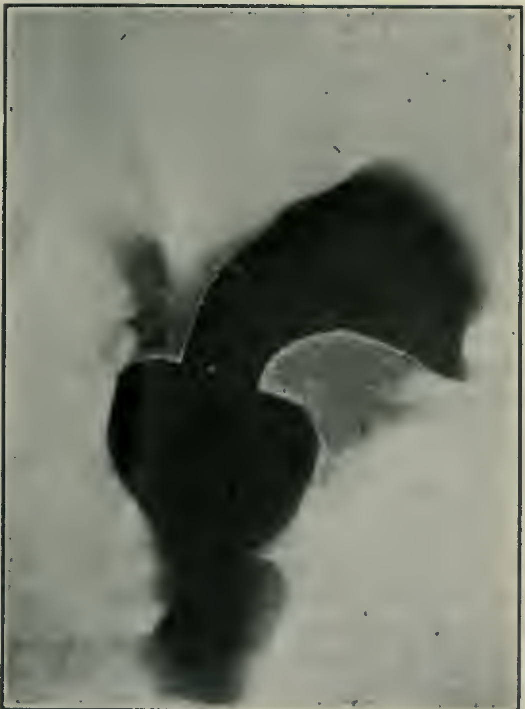

FIG. VI.

X-ray photo of Cancer of Stomach causing Hour-Glass constriction.

a pus basin. The following day he vomited twice, on each occasion filling a pus basin with apparently pure blood, and was again transfused, but died a few hours later.

A portmortem was done, when the lower end of the oesophagus, the entire stomach, and part of the duodenum were examined and found to be in normal condition, with no evidence of ulceration, cancer or growth. The spleen was about five times the normal size and adherent to the diaphragm, and the capsule was five times its normal thickness. The liver showed early cirrhosis. This was evidently a case of splenic anaemia (Banti's disease).

Case 10.—S. G. Aet 30. A nurse, gave a history extending over 15 years during which time she had been seen by many medical men, all of whom made a diagnosis of gall stones. While engaged in nursing a patient she was suddenly taken with severe pain in the epigastric region, extending through to the back, and causing faintness but not collapse. The large mass felt in the hypochondrium was thought to be a distended gall bladder, and the attack, gall stones. She was given a hypodermic of morphine and sent into the hospital, where she remained three days before operation. At operation a uniform tumour, about as large as a goose egg, was found in the anterior wall of the stomach about 1½ inches from the pylorus, having a small perforation in its centre which would admit a small lead pencil, and which was sealed over by the omentum. This mass was assumed to be carcinomatous, however a small piece at the edge of the perforation was removed for microscopic section and the perforation closed. The pathologist reported it to be inflammatory tissue. Owing to the very great size of this inflammatory mass and the possibilty of cancer developing later upon it, I advised its removal, but as the patient made such a splendid recovery she did not accept my advice . About twelve years later I performed a hysterectomy upon her for a large fibroid of the uterus, and at this time took occasion to examine the stomach, when I found the mass had diminished to one-quarter of its original size. It is now twenty-five years since the original operation, and she is still nursing.

Case 11.—Mrs. B. Aet 45. Ten years ago I removed an adenomatous polypus originating in the second part of the duodenum. She had had a hundred x-ray pictures taken in New York, from which a diagnosis of enlarged gall bladder pressing on the duodenum was made. The clinical diagnosis was obstruction of the duodenum, probably from a cicatricial ulcer. At operation an adenomatous polypus, as illustrated, was removed from the second portion of the duodenum. The patient had immediate relief of her symptoms and has continued in good health since.

Case 12.—Mrs. C. B. Aet 46. She had, for several years, symptoms of duodenal ulcer, confirmed by x-ray. She also had had several definite attacks of appendicitis. Believing the appendix had some relationship to the duodenal ulcer, we got her consent to the removal of the appendix. This was done with a para-rectal incision, when we found a scarring of a partially healed duodenal ulcer. The appendix was thickened and obstructed, and was removed. This operation was performed ten years ago. She made a good recovery, and in a few months time all her duodenal symptoms disappeared and have not returned. I saw her a few days ago, and she was in splendid health.

SEROUS MENINGITIS OF OTITIC ORIGIN*

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SEROUS meningitis as a complication of otitis was first discussed by Quincke.[1] The characteristic anatomical features of the disease are a serous infiltration of the pia mater, and an increase in the cerebro-spinal fluid in the subarachnoid space and in the ventricles of the brain. The surrounding brain tissue is infiltrated with serous exudate. According to Hammerschlag[2] the sigmoid sinus can be completely compressed by a large collection of fluid in the ventricles.

Serous meningitis is met with less often in acute than in chronic suppurative otitis and is a result of inflammatory irritation of the meninges, secondary to suppuration in the temporal bone. It may be associated with an extradural abscess or may be complicated by a brain abscess or a sinus thrombosis.

The diagnosis is made in cases where there develop a group of symptoms suggesting a beginning meningitis or a brain abscess but in which these symptoms rapidly disappear after removal of the suppurating focus in the temporal bone and incision of the dura without finding any evidence of brain abscess. The clinical symptoms do not differ to any extent from those of an early purulent meningitis or a brain abscess, but the clinical course is very different. Unrelieved by operation it may go on to death, but if the seat of infection is thoroughly removed and the dura incised the symptoms subside rapidly.

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*Read before the Eye, Ear, Nose and Throat Section, Canadian Medical Association annual meeting, Montreal, June 1923.

While cases of recovery have been reported where turbid fluid was found on lumbar puncture and a diagnosis of purulent meningitis established, this is quite unusual and the recovery of the case usually indicates a serous meningitis. Present opinion is rather against the performance of a diagnostic lumbar puncture in these cases as it is believed to favour the spread of infection in cases where the meninges may be at the time only locally involved. It is preferable in all cases suggesting this condition to thoroughly remove the diseased bone and incise the meninges, thus relieving the increased pressure and at the same time favouring the flow of cerebro-spinal fluid towards, rather than away from, the primary focus.

Diagnosis is established when this procedure has been carried out and a large amount of cerebro-spinal fluid escapes and the meningeal symptoms rapidly subside. If the severe symptoms continue after the incision of the dura it points rather to the presence of a brain abscess.

In a recent paper, Aboulker[3] reviews the subject, and reports a case in his own practice where the symptoms had developed some weeks after a simple mastoid which had failed to heal. The patient recovered from the meningeal symptoms but died some time later of tuberculosis and he was inclined to the opinion that in his case the serous meningitis was of a tuberculous origin secondary to a tuberculous mastoiditis.

The present case presents a fairly typical picture and is instructive as showing how alarming the symptoms may become and still recovery take place. In a former case I had a somewhat similar result, and such unexpected recoveries make one more optimistic as to the results of operation in the presence of serious intercranial symptoms.

The report is as follows:

N. L. Aged 53 years. Admitted to Royal Victoria Hospital, 12 December, 1921, complaining of a discharge from the left ear. Patient states that two months ago the ear pained him for a few days and then began to discharge. He has had very little pain since the discharge started, but the discharge has been persistent since onset. There has been no pain in the region of the mastoid, or headache.

Present condition.—Patient a thin sickly-looking man, but friends state that this is his usual appearance. There is no disturbance of temperature or pulse. The left ear shows a profuse purulent discharge without any foul odor, the canal is much narrowed by swelling of the posterior wall, so that it is impossible to see any details of the drum. Hearing normal on the right, only loud voice at ear on the left. Weber's test, the sound referred to the left ear. No nystagmus or other evidence of vestibular disturbance. X-ray of the mastoids shows a marked blurring of all the details on the left side. Physical examination of heart and lungs made by Dr. Hardisty, negative.

Diagnosis.—Acute suppurative mastoiditis, operation advised.

On December 14th a simple mastoid operation was done. There was no evidence of swelling or reaction in the soft parts, and the outer table was very hard and thick. On removal of the cortex the body of the mastoid was found broken down into a large single abscess cavity the size of a large cherry. The dura was exposed and formed the posterior wall of the cavity. The sinus wall was covered with thick granulations, and in one spot somewhat discoloured. The mastoid cavity was widely opened and the tip removed. Towards the end of the operation a small wound of the lateral sinus occurred, but was easily controlled by a light packing of gauze.

Dr. Bruère reported that the organism found in the pus was *Streptococcus haemolyticus*. The patient did very well during the next few days, and by the end of the week was out of bed and apparently convalescent. During this time there was no rise of temperature or pulse disturbance.

On the morning of the 21st of December, one week after the operation, the patient had a sudden attack of dizziness during the dressing. He was sitting up during it, but there had been no previous complaint at former dressings. He suddenly complained of feeling faint and dizzy and became rapidly unconscious. Pulse weak and rapid, marked disturbance of respiration with cyanosis. He was lifted back into bed, but did not recover for some time.

On examination of the eyes there was a marked nystagmus to the left, and concomitant deviation of the eyes to the left, but no convulsive movements of trunk muscles or extremities. Breathing irregular and laboured.

The attack lasted for about an hour, after which his condition seemed fairly normal as shown by Dr. Russel's report which was made an hour or so later, and was as follows: "Mentally clear and intelligent. Fundi normal. (This was confirmed by the ophthalmologist Dr. McAuley). Pupils equal and active to light and accommodation. Occular movements normal. No nystagmus. Fifth motor and sensory, 7th, 9th, 10th, 11th and 12th cranial nerves show no abnormality. Muscular system, no atrophy. Tone normal, equal on both sides. No incoordination, power good. Sensory system negative. Reflexes all normal, equal on both sides. Plantars flexion. Abdominal and epigastric active, equal. No Rombergism. No swaying to either side in walking. No headache, no vomiting. Suggest symptoms due to labyrinth irritation. No evidence of intracerebral abscess."

At 2 p.m. patient had an attack similar to the one in the morning but more severe. It was therefore decided to explore the wound in the hope of finding some focus which was causing the disturbance.

Second operation 21st December, 1921.—On this occasion a radical mastoid operation was carried out and the dura of the posterior and middle fossae widely exposed. The bone of the mastoid showed evidence of inflammatory change, but there was no focus of retained pus demonstrated, nor was any further epidural abscess opened. No gross evidence of involvement of the dura beyond the perisinus abscess already mentioned. At the end of the operation the dura was incised in the region of the posterior and middle fossae and cerebro-spinal fluid escaped freely. Wound packed in idoform gauze.

On the following morning (December 22nd) patient's condition was not very good. His mental condition was much clouded and his general appearance very bad. His temperature rose to 102° and pulse 120, of poor volume and tension. Dr. Russel made the following report: "Patient lies with eyes open and is intelligent looking. Moves left arm freely and puts it to his head. When irritated moves both legs as far as one can see equally well. Will not respond to command or question save with irritated look. (Aphasic?). Pupils equal and active to light. No facial asymmetry can be made out. Reflexes:—both knee jerks obtained, not exaggerated. Plantars both flexion. Abdominal and epigastric not obtained. Arm jerks present on the left side, absent on the right. Suggest cerebral lesion, probably inflammatory. Internal capsule anterior part (?)

In the afternoon of the same day (December 22nd) patient's condition seemed to grow worse, and he had every appearance of sinking into deep unconsciousness. His general condition certainly suggested a rapidly approaching termination. As the localization was indefinite and the man's general condition looked so desperate it was decided not to undertake any further operation.

On the following day there was a striking improvement both in the mental state and the general condition. He had recovered consciousness and talked fairly intelligently. Report of Dr. Russel on the 23rd as follows: "Patient much improved. Talks fairly intelligently, perhaps slightly confused. Fundi normal. Pupils dilated. Occular movements normal. Cranial nerves normal. With the Weber tests the sound was referred to the right ear. Can move the right arm quite well. Power good. No incoordination or involuntary tremor. Reflexes normal. Patient has no remembrance of former examination."

This improvement continued uninterrupted until the man's recovery was complete. On the 11th of January the plastic operation was done, and the wound cavity grafted with skin. On the 27th of January patient was discharged in good condition, though the epidermization was not quite complete.

March 6th, 1922, the patient reported in good condition. Health now as good as ever. Ear healed. Cavity shows considerable contraction, but healthy. The Eustachian tube persists open, but not discharging.

I have to thank Dr. Colin Russel of the Royal Victoria Hospital for kind co-operation and advice in the treatment of the case, and the reports of the neurological examinations. Also Dr. McAuley and Dr. Hardisty for special examinations.

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SOME OBSERVATIONS ON SCHOOL HEALTH SUPERVISION IN RURAL AND URBAN CENTRES*

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In reviewing the literature dealing with this subject, much of interest can be discovered, chiefly applicable to the hopes and reasons that prompted its inception in various countries and communities. The first worth-while note is to be found in a report submitted by a small committee of its members to the National Convention in France in June 1783, which reads as follows: "A district health officer shall be entrusted with visiting each quarter, the national schools of the district. He should examine and give advice regarding the most suitable gymnastic exercises. He should examine the children and lay down general and detailed rules for the safeguarding of their health.[1]" This comprehensive and far-reaching programme unfortunately was not possible of adoption, owing to the disturbed condition of affairs during the Revolution. As to the type of work done, it is worthy of note that in France, where the work was inaugurated in 1834 and firmly established in 1883, it is only within very recent years that the interest of the school health staff in the individual child has superseded the consideration of the well-being of the school as a whole. A sanitary survey and an attempt to control communicable disease was the evident aim of the school medical officer. This criticism, however, is only applicable to some centres, the plan adopted in Germany, generally described as the Weisbaden plan, seemingly having for its objective a large interest in the physical condition of each pupil presumed to be subnormal.

Some of the dates that stand out in the history of this movement are those associated with its extension to North and South America, Australia, Japan, and its nation-wide adoption in England and Wales. The city of Boston is usually credited with having the first school health service in the United States, begun in 1894. The Republic of Argentine instituted a very important programme in the early nineties, and Japan and Great Britain adopted it in a national way, the former in 1898, the latter in 1907. The year 1894 is also worthy of mention as the one in which school nursing had its beginning on a small scale in London, England. The almost universal adoption of this service in some form throughout the civilized world, has been so exceedingly rapid that there is practically no urban centre of any size but that has some type of school inspection by nurses or physicians.

A brief word in passing as to the aims of the work, and some mention of the early and, in some places, present criticism of it by the medical profession are here inserted. While primarily its inception was prompted by a desire to combat communicable disease and to supply the necessary sanitary supervision of school buildings and, in some countries with military aspirations, to circumvent any attempt at evasion of the required gymnastic exercises and drill on the plea of ill-health, the full possibilities of the service are to-day widely recognized, and are aptly put by Dr. Cornell,[2] as follows: "(1) the detection and correction of physical defects. (2) the detection and exclusion of cases of parasitic and communicable disease. (3) the maintenance of good hygienic conditions in the schools. (4) the diagnosis and treatment of cases of mental subnormality. (5) the correlation of medicine and pedagogy in order to produce the maximum of efficiency in the school system consistent with the preservation of health."

Presuming that Dr. Cornell includes in the last of the aims mentioned, the need for an early adoption of a more tangible, concrete, and comprehensive programme of health teaching throughout both grade and secondary schools, from kindergarten to graduation, I see no reason why we should not all subscribe to the above statement of the objects of school health supervision. That the immediate need for the placing of a larger measure of emphasis on this last mentioned aspect of the work, is very necessary, especially in view of the importance too often attached to the corrective side, is rapidly becoming appreciated by all, in fact the statement that the future of preventive medicine is largely dependent on a more widespread and thorough adoption of real HEALTH teaching in the schoolroom is not by any means an exaggeration.

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*Read before the Section of Preventive Medicine and Hygiene, Academy of Medicine, Toronto, March 29, 1923.

Much of the criticism that has been directed at this service emanated from the medical and dental professions. Whether this criticism is warranted or not is a question that interests exceedingly those actually carrying on the work. Criticism levelled at certain individuals associated with school medical and dental inspection, especially in its pioneer days, was sometimes more than merited, but that SCHOOL HEALTH SUPERVISION in its most desirable form is an attempt to supplant the family physician or dentist, is a statement probably less applicable to this type of preventive medicine than it is to any of the other more generally recognized legitimate public health activities.

There are three types of school health service in vogue in various parts of this continent, and these I mention but briefly; first, that carried on by a physician working alone, in which he visits the school periodically once, twice, or three times a year, and by means of an examination, of necessity superficial, presumes to suggest that certain children need treatment for certain conditions presumed to be present. This is merely a stop-gap type of service, and is of doubtful value. A second method whereby a nurse works alone, is the method perhaps the most general of adoption in the smaller centres and is the one most often criticized. In defence of this plan I would say that as the discovery of children who are physically below par is but one of the objects of this service, and as the question of diagnosis and treatment is to be left to the family physician or dentist, I feel that a well-qualified school nurse, taking advantage of all the opportunities that present themselves for selecting such cases, should be able to render fair service. Keeping in mind the educational possibilities associated with intelligent home visiting and health teaching, I personally feel that this is a more desirable type of service than the one previously mentioned. The third and most worth-while plan is where a capable physician, working with a desirable type of school nurse, assumes with her the various duties associated with a reasonably efficient form of school health supervision.

While it was not my intention in presenting this paper to dwell at any length on the history of the movement, I have felt that some such introduction was necessary for a better understanding of the aftercoming observations and I offer this as my excuse for the time already taken up.

During some twelve years spent in part or full time school health work, it has been possible to gather some facts and figures, which I am hopeful will be of at least passing interest, and these I will attempt to present as accurately and briefly as possible, making such qualification as the circumstances demand.

	Figures for 1912	Figures for 1922
Number of children examined ...	21,136	23,639
Total no. of defects	11,040	9,258
Defective vision	1,940	1,186
Defective hearing	199	276
Defective nasal breathing	2,313	1,864
Abnormal Tonsils	3,823	3,681
Enlarged glands	2,536	264
Pulmonary disease	43	98
Cardiac disease	69	165
Nervous disorders	15	99
Orthopedic defects	89	62
Malnutrition	285	1,563

In comparing the findings of the school physicians for the year 1911-12 (the first year of this work in Toronto) with those of the present day, I appreciate the necessity of making due allowance for conditions existent then and not present in 1922, such as the lack of standard methods of examination and the recording of results, a too superficial type of inspection, the presence on the staff of a group of physicians who thought only in terms of treatment and not of prevention, and in some instances possibly the desire on the part of a few members of the staff to pile up evidence of their industry rather than to discover children with actual defects needing present treatment. But giving due consideration to all the possible contributing factors which might influence any difference which is apparent in the findings given below, there is still sufficient evidence to show that the work done in the early days of the service in the community mentioned was of a distinctly worth-while type, and that on the whole it did not warrant the criticism it received.

The wide difference in the figures as they apply to some defects is possible of ready explanation, as for example, there was undoubtedly ten years ago, altogether too much significance placed on the presence of enlargement of the precervical glands associated with carious teeth. The variance in the number of those dubbed "malnourished" is largely due, not to the absence of such children at the earlier date, but to the very recent emphasis which has been placed on this sign. The difference in the number of cardiac affections is largely due to the more thorough method of examination now in vogue, but as for the large preponderance of nervous disorders in 1922 I have no explanation to offer.

Owing to the lack in certain communities of sufficient personnel to serve the entire school population adequately, certain age groups are selected as those having the primary call on the services of the school health staff. In justification of this selective method it has been deemed wise to present some facts as to the age incidence of physical defects among school children, and in deference to the much larger group under observation, I am inserting the findings of Dr. Baker[3] of New York City, in preference to my own, noting only the differences between them at the close of the paragraph. The conclusions of Dr. Baker are that the major physical disabilities are little, if any, affected by the age of the pupil, that defective vision is markedly increased as the age of the child and his stay in school increases, that deafness is slightly increased, and that defective nasal breathing, abnormal tonsils, defective teeth, and malnutrition, reach the highest incidence level among the group just entering school. The Ontario figures differ only from the above in that deafness remained about the same, and that malnutrition (so-called) was about as common in the age group composed of those children between 12 and 15 as those between 6 and 8. These figures are not only interesting but are of material use in planning the work so that the most can be obtained for the effort expended.

Having in mind the local application of the old adage "that the proof of the pudding is in the eating," I have felt that our contention that the relatively large group of subnormal children who are referred for treatment, are definitely handicapped, and that the correction of the defect or defects present would remove this handicap, was fairly patent. I present, however, for your discussion the following conclusions obtained from the observation of a group of Toronto children, who had been successfully treated for abnormal tonsils and adenoids. I am indebted to Dr. Fleming and his staff for their cooperation in obtaining these figures.

Four hundred and twenty-seven children were included in the survey. The treatment was followed by mental improvement in 271 cases or 63%. No improvement was noted in 73 cases, or 17%. Information was not given on 83 cases, or 20%. As far as degree of improvement was concerned, mental improvement was "remarkable" in 33 cases, or 8%. The child progressed to normal in 36 cases, or 9%. There was "improvement" (unqualified) in 178 cases, or 42%. The improvement was "slight" in 24 cases, or 5%. The treatment was followed by physical improvement in 400 cases, or 94%. No improvement was noted in 18 cases, or 4%. Information was not given in 4 cases, or 2%. The physical progress was exceptional, in 37 cases, or 9%. The child progressed to normal in 29 cases, or 7%. There was improvement (unqualified) in 226 cases, or 53%. The improvement was slight in 108 cases, or 25 %.

The question of the relation, if one existed, of the presence of physical defects to school progress, prompted the examination of the physical record cards of some 2,000 children in the junior grades in some of the large urban schools. The findings are as follows:

Average age of children with no noted physical defect in Sr. I. grade, 8.29 years; average age of children with one physical defect, same grade, 8.49 years; average age of children with more than one physical defect, same grade, 8.70 years; average age of children with no noted physical defect in Jr. II. grade, 9.23 years; average age of children with one physical defect in Jr. II. grade, 9.57 years; average age of children with more than one physical defect in Jr. II. grade 9.70; average age of children with no noted physical defect in Sr. II. grade, 9.93; average age of children with one physical defect in Sr. II grade, 10.67; average age of children with more than one physical defect in Sr. II. grade, 10.69 years.

Feeling that possibly many of these children with defects entered school at a later period than those not so affected, the survey was extended to include the length of time at school in months.

Children with no apparent physical defects in Sr. I. grade, 16.4 months; children with one noted physical defect in Sr. I. grade, 17.8 months; children with more than one physical defect in Sr. I. grade, 19.6

In Jr. II. grade

Children with none, 24.5 months; with one, 26.9; with more than one, 28.1

In Sr. II. grade

Children with none, 32.1 months; with one, 37.7; with moro than one, 35.8.

No apparent explanation existed for the absence of the previous definite relationship between the presence of one and of more than one defect in the last grade mentioned.

A recent survey of the district of Haliburton and part of Muskoka, made partly with the hope of throwing some light on the incidence of thyroid enlargement in this section, prompts the rather startling statement that among the 1,721 children examined, 489 suffered from this pathological condition. That the possible significance of the condition was considered lightly by those affected, does not tend to minimize the seriousness of the problem associated with its eradication.

I wish to insert here the results of the surveys made in rural Ontario by the Departmental staff during 1922, and set alongside of these the Toronto findings of 1912. In doing this I am not intentionally contributing anything to the useless discussion as to whether physical disabilities are more common among urban than rural children, but merely to emphasize the presence of conditions which in 1912 in Toronto, and in 1922 in rural Ontario, demanded early correction.

	Rural Ontario 1922	City of Toronto 1912
No. of children examined	23,944	21,136
No. found with defective vision	2,297	1,940
No. found with defective hearing ..	606	199
No. found with defective nasal breathing	2,814	2,313
No. found with abnormal tonsils ...	4,161	3,823
No. with enlarged glands including thyroid	1,168	2,536
No. with pulmonary disease	101	43
No. with cardiac disease	344	69
No. with nervous diseases	332	15
No. with diseases of the skin	508	
No. with orthopedic defects	341	89
Total no. of defects found other than teeth	12,164	11,027

That there is a very evident need of the early adoption throughout the province of measures which will tend to remedy existing conditions, is fully apparent and requires no further comment.

In order to avoid criticism in a further series of associated figures dealing in this instance with the prevalence of malnutrition among school children, I am taking as my medium for comparison the results obtained in the nutrition survey of Drs. Brown and Davis,[4] made some four years ago in Toronto schools, and a survey made by Dr. L. G. Neelands in the counties of Kent and Brant during 1921-22, using the "weight for height" standard as an index. The number of rural children examined was 1.974. The number found below the standard set was 430 or 21.78%, the percentage of these showing no other apparent physical defect was about 10%. The findings of Drs. Brown and Davis, which included a larger number of children but with the same standard of measurement, in the city survey were 26% for all ages.

Owing to the seeming value of such a survey, I wish to give here the very interesting findings of S. D. Collins of the U. S. Public Health Service,[5] on the relation of physical defects to absence from school. These figures were gathered in the State of Missouri, include children from four small urban centres, numbering in all 3,786, ranging in age from 5 to 20 years, and, while conditions of school attendance in Missouri differ considerably from those in Ontario, the figures are of value in that they are the only ones of their kind I have ever seen. He says, "The rate of absence from sickness for children with defects is 22% greater than the rate for children with no defects, and the groups with defects were also absent from other causes than sickness, more than those with no defects. The rate of absence from sickness for children with enlarged or diseased tonsils is 12% greater than the "no defect" rate, and the rate for children with adenoids and defective tonsils, associated with other defects, is 31% greater than the rate for the children with no defects. The rate for children with defective vision was 9% greater, and the rate for children with decayed teeth was 3% greater than the "no defect" rate.

While it is impossible, owing to the lack of adequate follow-up work in the whole of the rural area surveyed, to present any very accurate report of the corrections obtained, much of interest is shown in some of the reports sent in from the districts in which follow-up work is carried on. I will therefore give two or three of these selected at random for the year 1921. I ask you to note that in no instance in the list given was the treatment carried out by any but the family physician or dentist, or under his direction.

Unit No. 1, Halton County.—Terminations other than teeth, 578; of teeth only, 232; total 810. Unit No. 2 Peel County.—Corrections of teeth only, 254; of defects other than teeth, 287; total 541. Unit No. 3, Welland County.—Corrections of teeth only, 369, of defects other than teeth, 372; Total 741.

While these are but a few examples of the results being accomplished outside of the larger centres, they will serve to show that there is a very ready response to any practical attempt at the solution of this problem in the rural and small urban areas.

In conclusion I am desirous of outlining the school health programme of the Provincial Department of Education, which department exercises supervision over this service in all rural areas and in the urban centres having a population of less than 200,000. The Division of School Hygiene maintains a field staff of physicians and nurses, whose chief duty is to arouse the interest of the public in this service in the rural districts, and to offer a temporary form of school medical inspection in the more sparsely settled portions of the province. On the entry of the physician and nurse into a county or portion of a county, a survey is made which includes the physical examination of all children of school age, notification of parents of defects found, and the making out of an accurate record of the findings on the standard form supplied. A report of the sanitary condition of the building and grounds is also made out and, coupled with whatever recommendations deemed necessary, is sent on to the local Board. Any follow-up work thought to be urgent is also done by the nurse who accompanies the physician. At the conclusion of this survey, sufficient of the local boards are urged to unite to make some practical form of permanent service possible. In the event of the formation of a unit, (which is the area to be served by a full time school nurse and must not contain more than forty class-rooms, and should be so situated geographically that transportation of the staff is not too difficult) the Department aids in the inauguration of the permanent organization, maintains regular supervison over the appointee, and assists in defraying the cost of the service by an annual grant of $10.00 per class-room. That the plan is feasible and of value is evidenced by the fact that while the first of these rural units was established first in February, 1921, there are now 22 of them in actual operation throughout the province, and present indications promise a material increase in this number during the year 1923.

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The Development of Intestinal Surgery.—Harry Hyland Kerr, Washington, D.C., concludes his review of the development of intestinal surgery as follows: The history of intestinal surgery is punctuated by the gradual establishment of definite surgical principles. Intestinal wounds heal, not by reciprocal healing of adjacent cut edges, but by adhesion of the inverted peritoneal coats. Each bite of the suture should be securely anchored in the fibrous coat, thus necessitating only one suture. All openings of the intestine, whether perforations or anastomosis, should be closed transversely by a continuous suture. Ideal aseptic intestinal resection is readily performed by the basting stitch method. The method is applicable to all forms of anastomosis of viscera covered by peritoneum.—*Jour. A. M. A.*, Aug. 25, 1923.

CHRONIC MYOCARDIAL DISEASE*

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London

THE prime importance of the myocardium is emphasized by its relationship to every disorder of the heart and the fact that all diagnostic, prognostic and therapeutic considerations must be based on an intelligent appreciation of the condition of the cardiac musculature, for on its functional capacity are dependent the comfort of the patient, the efficiency of his circulation and the duration of his life under all the vicissitudes which are liable to lead to its impairment Among the varied pernicious influences commonly credited with the ultimate undoing of the dynamic power of the heart I would mention valvular, arterial, and pericardial morbid processes, advanced anaemic and cachetic states and intoxications, the acute infections, nervous stress, and a too ardent worship at the shrines of Bacchus, Venus and Vulcan, while not a small proportion of the individuals are by heredity the unfortunate victims of a defective vital endowment (myocardism). Whatever contributory part these may play, I am disposed to attribute by far the major rôle in the genesis of the myocardial changes to which I am referring to that group of chronic infections associated with the tonsils, teeth, accessory nasal sinuses, etc., which are now the definitely determined etiological agents in the production of various other chronic progressive processes in the joints, kidneys, vessels, and nervous system.

Whichever of these factors, or more frequent association of these factors, may be in operation, the condition of the coronary circulation is the one intrinsic factor which controls the nutrition of the cardiac muscle and determines its ability to adapt itself to usual or unusual demands.

While in a very small minority of instances fibrotic or fatty changes are obvious to the naked eye, in quite the majority the muscle appears normal or yields evidence of degenerative change only to scrutiny through the microscope. In but a few instances is it possible during life to establish a definite relation between the functional activity and the histological condition of the heart muscle, so that the clinical manifestations formerly associated with "fibroid" or "fatty" heart must be attributed to a condition of myocardial inefficiency dependent on degenerate changes other than these.

Numerous efforts have been made to determine some means of definitely estimating the functional capacity of the heart muscle, but so far these have proven far from satisfactory and at best not available for clinical use. Consequently we are dependent for the present on observing the facility with which abnormal subjective sensations or objective signs are produced under the influence of the strain to which each different individual might be subjected in the pursuit of his usual routine and the readiness with which the increased pulse rate is restored to normal and the induced discomfort disappears. This response of the heart to effort is the index of the condition of the myocardium and at the same time, of the patient's limitations. Definite anginal sensations are always significant of heart muscle failure, and no matter how trivial they may appear to the patient, must always be regarded with gravity.

The clinical picture is extremely varied. The subjective symptoms are as a rule most in evidence, the physical signs even in advanced cases being frequently inconspicuous. In by far the greater number of cases there is an insidious development of manifestations which if properly interpreted would lead to an earlier recognition of the serious underlying condition and with the establishment of a proper regimen, the supervention of the more grave sequels might be indefinitely deferred.

The subjects are usually middle-aged or elderly individuals, more commonly men. Some general debility more or less marked precedes or accompanies the symptoms more definitely related to the heart. This is at first only a disability to "come back" at one's work with the usual vigour. For more or less prolonged periods, there may be no further evidence of the myocardial weakening unless some unusual effort is necessitated and then the response to the call is not readily met. A little hurry to catch a car, or some other trifling exertion is followed by an attack of breathlessness, palpitation, retrosternal oppression, giddiness, or faintness, which is not recovered from with normal readiness.

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*Read at the meeting of the Ontario Medical Association, Windsor, June, 1923.

A pallor of vasomotor origin often mistaken for anaemia and a slight general puffiness of the skin best noted after applying the bell of the stethoscope are usually present early.

At this time, or not infrequently at an earlier period, some evidence of the dynamic variation can be obtained by a careful physical examination. The apex beat may be in its normal location or be somewhat, though not usually greatly, displaced to the left. The transverse cardiac area may be normal or but slightly increased. The first sound at the apex may be slightly lacking in muscular tone or its duration or intensity may be diminished. (In examining the heart always demand a normal first sound). Some little increase in frequency of, or an abnormally readily disturbed, pulse rate, with or without notable arrhythmia is often present, while palpation or the sphygmomanometer may show a normal, subnormal, or not infrequently an increased pressure. It is in the use of the sphygmomanometer that one may early demonstrate an inequality of systolic force which may not be appreciable to the finger over the artery or to the ear at the apex. If one carefully palpates the pulse, just as it returns following its obliteration by the cuff, one will note a variation in force of the individual beats, which is not demonstrable with the full volume of the pulse.

A careful investigation of the extreme bases of the lungs also furnishes a valuable sign. Here, if one reverses the usual order of physical examination and carefully auscultates, not the apices but the most dependent thin tongue of lung at the base posteriorly, on a forced inspiration there may be heard a few fine moist râles. To demonstrate them it is necessary to listen carefully with the first full inspiratory excursion, as on full inflation of the lung these râles may disappear and do not reappear for some little time. They are early evidence of the hypostasis and oedema, which later in the course become more prominent features. From an extended observation of these two signs I am convinced of their confirmatory value, when present along with some of the earlier subjective symptoms of which dyspnoea and retrosternal oppression are of prime importance.

It is at this period that the adoption of proper measures may be of value in retarding the aggression for such hearts may on occasion "find themselves." But should our warning pass unheeded and, as not infrequently happens, the patient fails to conform to the new order of things the process pursues its usual relentless march or is expedited by the prosecution of sundry abuses. The trivial dyspnoeic attacks appear at shorter intervals and with less provocation and painful sensations often amounting to true angina are added to the retrosternal oppression. Gradually the terminal phases are evolved. The earlier dyspeptic symptoms become more pronounced, the slight though significant variations of pulse become more definite arrhythmias. Of these bradycardia or tachycardia are noted less often, more frequently fibrillation or pulsus alternans. The increasing dyspnoea necessitates the sitting posture. The respiratory rhythm assumes the Cheyne-Stokes type, the patient becomes cyanosed, restless, irritable, sleep is disturbed and mild delirium supervenes.

Some variable oedema appears in the lower extremities along with more or less effusion in the pleura and peritoneum, but it has been unusual to see such extensive dropsies, as feature so commonly the cases of chronic valvular disease with decompensation. The more protracted the course, the more marked as a rule is the dropsy. In the cases dying suddenly, in more or less apparent health, it is as a rule conspicuously absent.

Hypostatic congestion of the lungs and liver, the latter often accompanied by slight icterus, and passive accumulations in the serous cavities, evidence the progressive failure of the heart. Gallop rhythm supervenes and the patient lapses into unconsciousness and death ends a distressing scene.

To recapitulate the early features on which to base a diagnosis:

(1) An attack of "acute indigestion" particularly when supervening without apparent provocation, or the occurrence of unusual breathlessness or retrosternal oppression or anginoid attacks following ordinary or moderate effort in a patient at or past mid-life.

(2) Alterations in the character of the first sound of the heart.

(3) Inequality of systolic effort observed earliest and best when employing the sphygmomanometer cuff.

(4) The occurrence of fine moist râles at the extreme base of the lungs posteriorly.

(5) In any cardiac case when conditions indicate the employment of digitalis and its exhibition fails to ameliorate, the suspicion of myocardial disease should arise.

The immediate prospect in any case is always uncertain. In a small percentage in which the disability may be dependent on muscle fag or on a transitory mild infection which may have escaped our recognition, a recovery almost or quite complete may ultimately ensue if requisite care is exercised. At the present I know of no way of definitely distinguishing in the early phases this class of case from those which comprise by far the large majority and whose more or less remote future forbodes disaster. The victims tread a precarious path throughout their course, for at any period life may be abruptly terminated by syncope or an attack of angina or acute oedema of the lungs. On the other hand if recognized early and a proper regimen instituted, life may be prolonged with a moderate measure of comfort and usefulness for some considerable time. The not infrequent association with arterial sclerosis, nephritis, or valvular disease necessarily diversifies the picture and makes the outlook much less hopeful while the gravity of the occurrence of such infections as pneumonia or a bronchitis of even moderate severity is only too frequently brought home to us.

As regards the management I think it is advisable to acquaint the patient with his condition, once we are assured that the changes have been inaugurated, for though we must at present acknowledge in most instances the inefficiency of an attempt to eradicate the process when established, yet with his co-operation much may be done to defer the ultimately disastrous consequences. I shall not take up your time with much detail, but content myself with indicating the lines along which one may expect to obtain this postponement.

(1) The removal of any and all foci of septic infection. This is strongly to be recommended in all instances even though one can advance no evidence that it effects a cure. There is no doubt that the patient is relieved of further deleterious influence from these sources.

(2) The curtailment of the demands on the heart as far as possible is of paramount importance. Undue physical effort, excitement, worry, or nervous strain should be carefully avoided.

(3) The diet should be nutritious and consist principally of proteins with a limitation of bulky foods, fluids, and starches, the liquids on account of their bulk and the increase of the intravascular fluid which they promote, the latter because of the possibility of fermentative distention and consequent cardiac embarassment. Sugar on account of its crystalloid properties is readily absorbable and offers a food for immediate utilization.

(4) Exercise, as walking on the level and on gradients and golfing may be indulged in, but in all instances this must be limited so as not to be productive of breathlessness or fatigue. When active exercise is precluded on account of the ready appearance of dyspnoea, oppression, or actual pain, massage and passive movement may be employed, though in some cases even this is not tolerated.

(5) The maintenance of a free daily evacuation of the bowels is of the utmost importance. Mild laxatives such as phenolphthalein, pill alophen or cascara at night may insure this. The cascara can often be beneficially combined with some hydrochloric acid and nux vomica. An occasional mercurial followed by a saline or castor oil has often a salutary effect.

(6) In many ambulant cases I have found it beneficial to put patients with the less pronounced manifestations to bed for a day or two every week or ten days. Rest in bed is obligatory when breathlessness and retrosternal oppression are more or less continually present or are provoked on the slightest exertion. This is all the more imperative if pain

is produced. Even talking may have to be interdicted.

(7) In considering the employment of remedial agents one naturally turns to those of the "cardiac group" but indications for their use are seldom present. Digitalis is generally admitted to be *facile princeps* in this class, but it is questionable if its utilization here does not in many instances prejudice the already damaged muscle. In the earlier phases I have with very few exceptions, found its employment without any apparent beneficial effect, while in the advanced case I am convinced of its uselessness. I am well aware that digitalis has the unqualified endorsation of good authority, but the improvement following its administration may possibly correspond to a period of amelioration natural to the problem, for remissions and exacerbations more or less pronounced and of variable duration characterize its course. What I have observed with reference to digitalis has been confirmed with other members of the group. Latterly when I have yielded to custom, I have employed strophanthus to the almost exclusion of digitalis because of its more rapidly attained effects and its being less likely to produce gastric disturbance.

From camphor in oil I have never obtained any effect that could not be attributed to the vasomotor reaction to the skinprick of the needle. True when camphor is topically applied to the heart muscle it acts as an irritant, but given subcutaneously it is very doubtful if it has any possible effect as it is immediately converted into inert camphglycuronic acid. With quinidine I have had no experience.

The nitrites may be of service in cases with hyperpiesis or where anginal attacks occur. Of these amyl nitrite on account of its ready adminstration, gives the most promise. Potassium iodide may be mentioned as being of more doubtful utility. It can be of service only when a definitely syphilitic process is implicated. As regards the dropsy, I have found the various remedies, (digitalis, diuretin, spartein, theocin, and alkalis) employed under other circumstances to almost if not entirely fail me. The removal of the serous effusion into the pleurae by the aspirator affords but a slight and transitory amelioration of the respiratory distress.

Against the inefficacy of the drugs mentioned I would place the beneficent effects of carefully controlled doses of morphine, always having in view the fact that with its continued employment the effect tends to wane. The relief which comes with its occasional use in small doses in the early stages from the attacks of restlessness, sleeplessness, respiratory distress, and angina can be obtained from no other agent. After a night's rest under its influence the pulse is found improved and the patient feels very much better. Sulphonal, chloral and other members of the "hypnotic group" which are recommended for insomnia while of value in the earlier phases, in my experience seldom produce the desired result in the advanced problem. In the terminal phases of the condition there is a still more notable absence of response to either rest or drugs, and the care of a competent nurse and the free use of morphia comprise the sum total of the therapeutic measures at our command.

Surgery of the Appendix.—The high operative mortality in cases of acute appendicitis, and the post-operative morbidity in cases of chronic appendicitis, are in the opinion of William E. Lower and Thomas E. Jones, Cleveland, due in large measure to the common belief that in each case the only proper procedure is the removal of the appendix. When the patient with acute appendicitis comes to operation, the removal of the appendix alone does not correct the danger already done by the attendant peritonitis, and there should be a more general appreciation on the part both of the laity and of the profession that acute appendicitis with attendant peritonitis is not a localized but a systemic disease, to which the appropriate after treatment as well as appropriate operative procedures themselves must be applied. The morbidity after operations for chronic appendicitis in the majority of cases is due to incorrect diagnosis. Correct diagnosis in cases of supposedly chronic appendicitis and the proper handling of the acute case will lower the mortality rate of the latter condition and the morbidity rate of the former. —*Jour. A. M. A.*, Aug. 25, 1923.

THE ORIGIN OF AMMONIA IN THE URINE*

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THE object of this communication is to present data confirming, clinically, the view recently put forward of the origin of urinary ammonia from the renal epithelium. The results obtained appear to be of more than abstract interest to the clinician. Not only must an additional interpretation be applied to, but a greater value is found in the results obtained by, a common laboratory test of clinical importance. This applies especially in the study of diabetes mellitus and the various forms of nephritis.

Briefly, the generally accepted view of ammonia formation and excretion is that the ammonia originates from the amino group of amino acids during the intermediary metabolism of the latter. The greater part of the ammonia thus formed combines with carbonic acid forming ammonium carbonate, the lesser part with other available acid radicals. The ammonium carbonate is further converted into urea. When an excess of acid is present in the body owing either to retention of normally formed acids as in renal lesions, or to a production of new acids as in diabetes, the ammonia unites with these rather than with the carbonic acid. Under these conditions less ammonium carbonate is formed and therefore less urea, and thus an amount of ammonia greater than the normal is found in the urine. Because of this phenomenon and the simplicity with which the estimation of urinary ammonia is performed, its estimation in diabetes is more practical in giving an approximately quantitative idea of acid production in the body than any other test. Though the amount of ammonia excreted *per diem* by a normal individual is less than one gram, in diabetes as much as five grams are frequently noted and eight to ten grams have been recorded.

The value of the estimation of the daily excretion of ammonia in a diabetic becomes enhanced, when comparison is made of the results obtained by this and other tests in common use. As a daily routine in the study of the metabolism of diabetics in this hospital the determination of the total acetone bodies in the urine, a time consuming procedure, has been replaced for practical purposes by the titration of the total organic acids (Van Slyke and Palmer).[1] The parallelism between the results of both methods was first demonstrated by the authors of the test and almost invariably noted in further clinical studies.[2] Because of the relative simplicity and rapidity with which the total acid content of urine (cc. N/10 acid + NH_3) could approximately be determined, this has also formed part of the daily routine tests. In the absence of bicarbonate administration, the parallelism between this test and total organic acids is striking. The value of ammonia determinations is thus greatly enhanced. To this there is an exception—diabetes associated with a renal lesion. During the observations in such cases it was occasionally noted that, although much acid was excreted, unexpectedly small quantities of ammonia were found. Determining the amount of ammonia by itself in these instances did not appear to have much clinical value as an index of the severity of the acidosis. Henderson and Palmer[3] first pointed out that in some forms of nephritis the total cubic centimetres of acid plus ammonia may be diminished, and in a statistical sense the intensity of the acidity of the urine in all forms was increased owing chiefly to a decrease in the excretion of ammonia. The mean value of the pH in cardio-renal disease was 5.33 as compared with a pH of 6.00 for normal urine. In such instances a condition of acidosis may be accompanied by a diminished excretion of ammonia. In view of recent experimentation this phenomenon is more readily appreciated.

In 1921 Nash and Benedict[4] first demonstrated the possibility that the ammonia found in the urine has its origin in the kidney. This phenomenon, if operative, explains more readily as pointed out by these authors, the depletion of the alkali reserve in the body under certain conditions. If the efficiency of the kidney becomes impaired, the formation of ammonia is diminished or if it does not keep pace with the rate of an excessive acid production other fixed bases in the body must be called upon in the regulation of the body neutrality. In nephritis it explains the increase in the intensity of the urinary acidity and renews interest in the study of urinary acidity in the estimation of renal efficiency. In a diabetic acidosis associated with nephritis it explains the finding, recorded above, of a marked excretion of acid bodies and an unexpectedly small quantity of ammonia. In diabetes associated with nephritis, the unreliability of urinary ammonia as an index of the severity of the acidosis present is apparent. However, if the explanation of this phenomenon really be defective function of the kidney in the formation of ammonia the estimation of urinary ammonia in cases of diabetes with nephritis not only does not lose its value as formerly regarded, but its clinical importance is enhanced. The ammonia may under these circumstances be no index as to the degree of acid production, but it becomes an index of impaired renal efficiency. To recognize this insufficiency is most essential in the treatment of such diabetics, since with vulnerable kidneys they are more readily susceptible to an acidosis.

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*From the Department of Metabolism, Montreal General Hospital.

The view that the kidney is the seat of urinary ammonia formation appears to be confirmed by the data obtained and recorded here. Observations were made in cases of diabetes with and without apparent renal lesions (albuminuria, casts, blood, and urine renal efficiency tests). The other daily routine data, blood and urine sugars, etc., are purposely omitted, having no direct bearing on the subject.

Technicical Methods:

Blood:	Urea nitrogen (Van Slyke)
	Creatinine (Folin)
	CO_2 Plasma (Van Slyke)
	NH_3 (Nash and Benedict)
	Total acid soluble phosphorus (Bell and Doisy)
Urine:	NH_3 (Folin)
	Organic acids (Van Slyke and Palmer)

Discussion of results.—From the data recorded in the table, observations are made upon (a) the relation between the actual and calculated ammonia in all cases; (b) the relation between the degree of acidosis and ammonia excretion in diabetes with and without renal lesions, and (c) the relation between the degree of impairment of renal efficiency and ammonia excretion in all cases.

The values obtained for the "calculated" urinary ammonia are based upon the same assumptions as those of Nash and Benedict. Thus (a) the rate of blood flow through the kidneys is 150 cc. per minute per 100 grms. of kidney tissue, (b) the total weight of the kidneys is 300 grms. and therefore (c) the total volume of blood which can possibly pass through the kidneys during 24 hours is 648 litres. If the concentration of ammonia in the blood in normal individuals is approximately 0.1 mgms. per 100 cc. applying the above data, the total amount of blood brought to the kidney *per diem* (648 litres) would account only for 0.648 grms. of ammonia in the urine. Though this corresponds with the average amount of amminia found in the urine of normal individuals it cannot account for the large quantities found in various diseases.

A consideration of the values of the blood ammonia found in these instances and the total volume of blood passing through the kidneys *per diem* shows that not nearly sufficient ammonia can have passed through the kidneys from the blood to account for the total amount found in the urine. It will be noted that in none of the cases of diabetes mellitus free from renal lesions do the actually determined and calculated quantities of urinary ammonia correspond, the actual being as much as eleven times greater than the calculated (Case 9). This discrepancy becomes still greater when the possible sources of error in the technique are considered. Rubber stoppers were employed in the apparatus for the determination of the blood ammonia. An effort was made to prevent as far as possible the absorption of ammonia from the laboratory. The blood ammonia values if they err at all owing to the use of rubber stoppers, do so in the direction which will increase their actual value and thus show less descrepancy than is apparent be-

		BLOOD					URINE							CLINICAL
		Milligrams per 100 cc				Vol. %					Organic	NH_3		
No.	Hosp. No.	Urea. N.	Creatinine	Acid sol phosphorus	NH_3	CO_2 (plasma)	Albumin	Casts	Acetone	Diacetic acid	Acid cc N/10 perdiem	Actual	Calculated	
1	1407 /22	189	6.97	19	0.08	31	+++	+++				0.16	0.51	Chronic nephritis
		270	6.98		trace	29								pre uraemia
		266	6.66		0.03	24	+++	+++				0.11	0.19	
2	2020	70	3.0											Bichloride poisoning
		105	4.1											
		126	4.2	18	0.06	38	+++	+++				0.02	0.38	First specimen in 72 hours
3	2195	63	1.26		0.06	48	+++	+++				0.38	0.38	Chronic nephritis
		105	3.56	26	0.09		+++	++				0.16	0.58	Streptococcus septicaemia
		129	3.00		0.02	39	+++	+++				0.14	0.12	
4	2783	21	1.3		0.12	35	0	0	+++	+++	3080	3.6	0.87	Diabetic severe
5	3470	24	1.1		0.06	29	0	0	++++	++++	2160	2.2	0.38	" "
6	3839	112	10.2		0.10	10	+++	+++	++++	++++	1840	0.41	0.64	Diabetic coma Uraemia (8 hr. urine specimen
7	5381	219	3.6	21	0.04	56						0.29	0.26	Urethral structure
		133	1.76		0.10							0.26	0.64	Acute retention two days
		83	1.85	14	0.07							0.29	0.45	
		57	1.59		0.10								0.64	
		46	1.50	15	0.11							0.41	0.71	
8	5659	36	2.3		0.11	55	++	+	+++	+	2300	2.0	0.71	Diabetes, Chr. nephritis
9	5831	24	1.42		0.07	30	0	0	+++	+++	4050	5.1	0.45	Diabetes precoma
		22			0.11	36	0	0	+++	+++	2945	3.7	0.64	
		23			0.08	32	0	0	+++	+++	4200	4.4	0.51	
		26			0.04	27	0	0	+++	+++	3645	4.7	0.26	
		22			0.07	20	trace	few	+++	+++	3164	4.2	0.45	First evidence of renal lesion
		44	2.38		0.05	19	++	+	+++	+++	3176	2.2	0.32	Died
10	6163	19	1.0		0.10	46	0	0	++++	++++	1500	2.7	0.64	Diabetes severe
					0.05	46	0	0	++	++	2016	2.3	0.32	
					0.08	48	0	0	+	+	1260	1.8	0.51	
11	6421	50	2.3		0.09	82	++	++	+++	+++	2820	0.58	0.36	Diabetic coma Chr. nephritis (urine 14 hour specimen)
12	916 /23	34	1.72		0.06	54	++++	++++				0.15	0.38	Acute nephritis subsiding
		37			0.02		+++	+++				0.29	0.12	
		29			0.06		++	+				0.31	0.38	
		28			0.08		++	+				0.51	0.51	
		29			0.05		+	+				0.46	0.32	

tween the actual and calculated urinary ammonia. In cases 8, 6, and 11 showing diabetes with nephritis and impaired renal efficiency (increased blood urea nitrogen) the marked excretion of organic acids associated with approximately normal urinary ammonias is apparent. In cases 6 and 11 (coma) this is more striking since the urinary ammonia values were obtained from an incomplete 24 hour specimen, but the exact period was noted (urine obtained by catheterization) and calculated on the basis of a 24 hour excretion. The fall in the value of urinary ammonia in case 9, following the onset of a nephritis preceding coma, emphasizes the fact noted above that, although the urinary ammonia in such a case is no index of the degree of acid production, it is an index of vulnerable kidneys and modifies the treatment. In all the cases of nephritis the values of the blood ammonia were within the normal limits, in spite of the possible source of technical error recorded above. Since retention products of metabolism are expected in cases with renal lesions associated with impaired function, this feature again supports the view that the kidney is the site of formation of urinary ammonia. Since there was no other apparent factor to account for the low urinary ammonia values found in all forms of nephritis recorded, bicarbonate administration, diet, etc., it appears that such values can only be explained on the basis of renal inefficiency.

Conclusions.—Data have been obtained clinically which support the view recently put forward that one function of the kidney is to form ammonia.

Grateful acknowledgement is due Miss Althea Frith for technical assistance.

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IDIOPATHIC MENORRHAGIA AND X-RAY THERAPY*

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THE subject of uterine haemorrhage and x-ray therapy is no longer in its infancy, having been introduced by the French sometime about 1904. Since then it has steadily gained ground until now it is a well recognized procedure having a firm physiological and scientific basis.

The material for this paper is drawn from one hundred haemorrhagic cases, and on classifying them it is found that they can be divided into two main groups as follows:

A.—1. Idiopathic haemorrhage occurring at puberty, the menopause, and during the child bearing period. These cases showed no gross pathological uterine condition. 2. Haemorrhage occurring *in utero* which could be classified as subinvoluted, uteri fibrosi, etc., but showed no evidence of growth benign or malignant.

B.—Haemorrhage associated with fibromata. Haemorrhage arising from such conditions as ulceration, polypi, malignant growths, etc. do not belong to the domain of this paper. Those associated with inflammatory conditions and retroversion will be referred to later.

The majority belonging to class "A" most commonly are referred for treatment sometime between the ages of thirty-five and fifty-five. Cases near the menopause predominate, those at puberty form a small minority In this class, particularly among the older patients, it was formerly thought that the bleeding was due to some abnormality of the uterine wall, that either an increase of connective tissue or change in the arteries was present; such an explanation cannot be true because uteri removed for causes other than haemorrhage and not suffering from haemorrhage show changes in the myometrium and blood vessels, even more pronounced than cases suffering from menorrhagia. A common finding in haemorrhagic cases in either normal or fibrosed uteri, etc., is the swollen and proliferated endometrium. This condition was found by W. A. Scott in 64 out of 92 bleeding cases. For years there seems to have been a great deal of confusion concerning the exact cause of this haemorrhage until Hitschmann and Adler in 1908 and later Novak in 1917, announced the result of their work which clearly demonstrated that the cause of this haemorrhage lay without the uterus. They pointed out that the endometrium resembled the normal pre-menstrual change and that it was a perverted physiological condition. We know that the Graafian and primary follicles are intimately connected with the menstrual phonemena. Recent experiments clearly demonstrate that the corpus luteum contains some substance acting on the endometrium thereby controlling the menstrual cycle. Clinically it is surprising to find the frequency with which abnormalities of the corpus luteum are found in these haemorrhagic cases. While the corpus luteum is undoubtedly a most important controlling factor, yet as pointed out by Scott these idiopathic haemorrhages do occur at the time when the endocrine activity is liable to be abnormal, and from our experience we believe that they often play a most important part. Fortunately the x-ray controls both conditions through its action on the ovaries.

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Class "B" or those in which haemorrhage and fibroma are coexistent offer an added problem. The connection between the two is still under discussion. It would appear that there is some casual relation between the fibroma and the bleeding. The endometrium presents the same microscopic picture as in class "A" and when radiation is applied the bleeding readily subsides. The growth presents no added difficulty to the control of the haemorrhage. Just how the ray affects the fibroid is still under discussion. The French believe that it is brought about by direct action on the fibroid. Béclère has shown that from the first week after exposure 1cm. of shrinkage occurs and that this rate is maintained until disappearance. This reduction commences long before there is any appreciable change in the menstrual history. The Germans on the other hand believe it is brought about through the action of the ray on the ovary. Our experience would lead us to believe that the French theory is the more likely one as cases in which the ovaries are shielded have shown a marked reduction and disappearance of the fibroma. Whatever the action, there is no question that the fibroids do disappear under radiation therapy; even the larger growths show remarkable diminution.

Turning to the biological reaction of the tissues to the ray, we find that very careful experimental work was done by Halberstadter on animals as early as 1905. He exposed the female generative tract of a rabbit and noted that grossly the ovaries became smaller but showed no change in the primordial collicles or corpus luteum. These experiments were repeated by others, who by altering the exposure and increasing the subsequent time before conducting a post mortem, demonstrated that the primary follicles were definitely destroyed. On comparing these changes with the human radiated ovary, it has been repeatedly shown that the results are quite comparable. One case examined eighteen days after radiation showed gross evidence of haemorrhage on its surface; on section the primary follicles were undergoing degeneration.

Owing to more precise methods of measurement, we can now determine the exact amount of ray necessary to produce these effects in a given ovary, and from careful clinical and histological study we know that the action of the ray is not limited to one or two days but is continuous over a period of time which according to the dose may take months before its completion. As experience and experiments both point to the Graafian follicle as governing the normal and pathological menstrual cycle, and as these idiopathic haemorrhagic conditions largely depend on some abnormality in the life cycle of the primary follicle and corpus luteum, the x-ray is a very potent factor in curing these cases, especially so as the primary follicles are extremely susceptible to radiation.

Through recent developments in x-ray therapy there has arisen the question of giving a massive single dose by using a high voltage. This in itself has many favourable points but in actual practice it is not uniformly successful, which, in view of the severity of the treatment is very disappointing, especially as satisfactory results can be obtained by using lower voltage and smaller doses repeated after a few weeks' interval. This latter method has the added advantages of simulating more closely the normal menopause; it is not blood destroying nor does it produce the severe radiation sickness.

Considering the idiopathic haemorrhage occurring just at puberty or slightly after its onset one is loath to advise radiation therapy direct to the ovary lest the periods cease, yet the bleeding may become so severe and having resisted minor operative and local treatment the question of hysterectomy may arise, in which case case radiation therapy should first be tried by using a partial dose, hoping to subdue rather than to destroy the primary follicle. One must be careful not to promise that menstruation will not cease. A partial dose may cause cessation. That even this is justified there can be no doubt, as it saves the patient from the dangers of a major operation, besides there is always the chance that menstruation may return and with it the possibility of normal pregnancy.

There is a small group of patients at this period who are evidently suffering from some disturbance of the endocrines acting upon the ovaries and uterus; these cases suffering from profuse bleeding often show a coexistent enlargement of the thyroid, and some may even show mild symptoms of hyperthyroidism. Our experience would lead us to suggest that the thyroid be first treated. That there is a definite connection is well illustrated by the following case.

Girl, age 17, Canadian, unmarried, living at home under good hygienic conditions. *Family history.*—Negative. *Previous illnesses.*—Measles at five, diphtheria at fourteen years, bronchitis every winter. *Menstrual history.*—Periods commenced at 14; irregular for first year and a half, then became regular for one year, occurring every four weeks, lasting seven days with no more than the usual discomfort. At age 10 a goitre developed which has persisted, and at 16 the mother noticed it becoming larger; the patient became nervous and would tire easily. Shortly afterwards the periods became irregular until now they occur every ten days and last seven. A great deal of blood is lost, so much so that the mother notices patient is becoming anaemic (60% Hbg.) *Physical examination.*—Showed no abnormality in the female organs. The patient showed enlargement of the thyroid, slight tremor, sweating of the hands and increase in pulse rate.

Three courses of x-ray treatment were administered over the thyroid. Following the first the patient felt better; the menstrual flow did not occur for three weeks and was less in amount. Following the second and third course the periods arrived every four weeks and lasted two days. The goitre symptoms also disappeared; the enlargement in the neck lessened but persisted. This patient was examined two years later, during which time her menses had remained normal. They now occur regularly every four weeks and last four to five days.

Cases which occur during the child-bearing period are a more difficult problem. Naturally one does not wish to produce sterility if it can be avoided. For that reason uterine curettement should first be tried; if this does not cure then only two sources remain, viz., hysterectomy or radiation. The latter is undoubtedly the rational course as very frequently by giving a partial dose, one can temporarily depress the primordial follicles and so produce a temporary amenorrhea, but as in the younger class the prognosis must be guarded lest a partial dose prove a full dose for that patient. If the menorrhagia cannot be controlled by a partial dose then there is no alternative but to produce a permanent amenorrhea, which is easily accomplished and is vastly preferable to hysterectomy.

The treatment of cases at or near the menopause is a much simpler matter. Having shown it to be a perverted menstrual flow the treatment resolves itself into the destruction of the primary follicles, which is done so completely and easily that usually not more than two treatments are required. The ease with which this can be accomplished is in no small way due to the nearness of the natural menopause. The patient herself is more than grateful to be freed from a life so debilitating and confining.

Those haemorrhagic cases which are associated with fibromata present a double problem, depending on whether the haemorrhage is to be relieved or the fibroid to be reduced. If the bleeding be the predominating symptom then radiation is the method of choice.

The same problem will be met with in connection with the menopause as in the former group, as there is often some connection between the fibroid and the bleeding, and we know that a fibroid can be reduced by direct action of the ray. In the child-bearing period the ovaries can be shielded and the ray directed only upon the uterus, but if the bleeding should be caused by some ovarian abnormality, then the ovaries should be treated as in the former group.

Should the question of surgical interference be raised, especially during the child-bearing period, it must be remembered that bleeding does recur after excision of the fibroid. If, however, complete removal of the uterus is decided upon, it naturally eliminates any possibility of future pregnancy. Radiation therapy at this period ought, therefore, to be given a fair trial; it offers relief without completely removing the possibility of motherhood. If, on the other hand, the patient is just at or near the menopause, both the ovaries and uterus can be rayed without any hesitation and with success. While the treatment of fibroids does not fall within the domain of this paper unless associated with haemorrhage, yet in passing, it is worthy of mention that if pressure symptoms are present, we have a different problem and one which often demands a nicety of judgment. If the symptoms are urgent and are causing mechanical difficulties, then I believe that operation is indicated, provided of course, that the patient is a good operative risk. Yet if ample time be given, it must be remembered that shrinkage and complete disappearance can be obtained by radiation therapy. The latter method has the advantage in that it does not entail any danger and is less costly to the patient.

Since x-ray therapy has become so popular one often hears of the danger of the fibroid undergoing sarcomatous transformation, some surgeons and gynaecologists asserting it to be a common occurrence. It would appear, however, that as yet they cannot distinguish between the rapidly growing early muscular or connective tissue cell, and until some method is devised this point will always be in doubt. Such well known pathologists as Ewing and Bland Sutton both state it to be a very rare occurrence. Ewing after twenty years experience has only met with three cases undergoing sarcomatous transformation and showing metastases. It would, therefore, appear that such an assertion is more theory than fact. Lest, however, the bleeding should mask an early malignancy, either carcinoma or sarcoma, it is always advisable that a diagnostic curettage be performed, a procedure practised in many clinics previous to hysterectomy.

The bleeding associated with pelvic inflammation is still somewhat obscure and should be treated according to the cause.

When retroversion is associated with menorrhagia and giving rise to symptoms, it is advisable to replace the uterus by non-operative means and observe the effect before advising radiation, but if there are no symptoms due to the retroversion and especially if the patient is near the menopause, radiation will relieve the menorrhagia and should be prescribed irrespective of the displacement.

In all these types the radiologist must remember that he is dealing with a human being and one who is suffering from a debilitating condition. Proper co-operation with the attending physician should exist in order that the patient as well as her bleeding may be treated.

The results obtained to date in these cases of idiopathic menorrhagia are excellent; they have shown no return of the bleeding. Their ages ranged from 35 to 55. Excluding the case treated over the thyroid, in no case was it necessary to give more than two courses.

Those cases associated with fibromata have shown a uniform cessation of bleeding with reduction of the fibroids. Some of the larger ones have not disappeared but are markedly reduced, and are not giving rise to symptoms. The menorrhagia was controlled after the second course. The fibroids required from four to six courses. We also see a shortening of the menopause symptoms. The characteristic hot flushes seem to terminate more quickly than with the normal menstrual change. The artificial menopause does not appear to influence the sexual instincts. Care should be taken that pyschoneurotic patients are not treated lest rather severe mental symptoms are precipitated.

Balancing surgery and radiation therapy in the treatment of these idiopathic haemorrhages, there seems no doubt that the latter is the method of choice. Its application is simple; the patient is not exposed to the risk of operation with its possible sequelae. No surgeon can afford to treat the method with indifference.

THE DIAGNOSIS OF PULMONARY TUBERCULOSIS—THE APPLICATION AND INTERPRETATION OF DIFFERENT TESTS*

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I.—Examination of the sputum for the presence or absence of the tubercle bacillus:—This method still remains one of our most valuable assets, but it is not used in proportion to its importance and limitations. From the laboratory point of view there are three ways in which a test can be made:—(a) Direct smear and staining of the untreated sputum. (b) Initial treatment of the sputum with antiformin or one of the modifications thereof, the purpose of which is to make the sputum homogeneous. (c) Inoculation of guinea pig with treated or untreated sputum.

Those who prefer to search for the bacillus in treated sputum claim only a slightly higher percentage of positive findings. It is questionable whether the time employed in treating the sputum could not with almost equal advantage be spent with two important features of the direct method. These are, (a) the selection for spreading and staining of likely particles of the sample with the avoidance of bits of food or merely mucus, and (b) the time and care spent in searching with the microscope. The third method—that of inoculation—will undoubtedly demonstrate the presence of the bacillus in sputum in which by staining methods it has been impossible to find them. By this method the results will not be obtained before 3–5 weeks. This factor of time is not as important as it would at first sight appear, because the instances in which this method is used should be carefully selected after the thorough employment of other means of examination; such cases are likely to need a period of observation following the initial examination, and the results of the inoculation will probably be available when the final revision of the case is made.

The demonstration of the bacillus gives a stability and chronological permanency to the diagnosis; but beyond this its importance in that assemblage of data upon which the clinical judgment of the case should rest is in comparison small. The reported absence of the bacillus by itself means nothing; repeated failures begin to have a very considerable diagnostic value, especially if this information is correlated with certain features of the individual case. For example, in a case in which the physical signs are definite, and in which the sputum is considerable in amount, purulent or muco-purulent in character, the repeated absence of the bacillus is of much greater exclusive value than it is in cases in which these features are absent.

There are three chief points which would warrant repetition, they are:—1.—Based upon the prevalence of pulmonary tuberculosis the profession does not utilize this test in proportion to its importance. 2.—One or two negative results are of little value, and do not justify the exclusion of tuberculosis in cases in which on other grounds one may be suspicious of this disease. 3.—Repeated negative results with different samples, however, become of increasing exclusive value in proportion to the number of such and when considered in correlation with certain of the clinical features of the individual case.

II.—The albumin reaction in sputum[1]:—. Equal parts of sputum and of a 3% acetic acid solution are mixed, allowed to stand for a few moments, and then filtered. The clear filtrate is tested for albumin by Esbach's method as employed in urinalysis. The chief value of the test lies in its simplicity. While it is positive in a high percentage of well advanced cases, it is likely to be absent in those cases of minimal involvement presenting difficulties of diagnosis. It may also be present in other pulmonary infections such as bronchiectasis, pulmonary abscess, broncho-pneumonia, etc.

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III.—Goetsch test[2]:—The purpose of the test is to detect disturbed thyroid metabolism or hyperthyroidism; it is based upon the assumption that the condition of constitutional hypersensitiveness of the sympathetic nervous system, such as is associated with hyperthyroidism, can be demonstrated by the injection of adrenalin. It is thus applicable to those cases in which, although we are unable to demonstrate a positive tuberculous lesion by physical methods or the x-ray, we are nevertheless led to suspect that subminimal involvement may be the cause of the syndrome of poor work tolerance, easily produced fatigue, loss of energy, loss of weight, slight elevation of temperature, together with vasomotor disturbances. In addition the test can logically be used for those in whom we can demonstrate a probable or positive lesion which, however, on other grounds we believe to be non-operative, and clinically not the cause of the constitutional signs and symptoms enumerated above.

It should be mentioned here that basal metabolism determinations[3] will serve the same purpose and do so with greater accuracy. A negative Goetsch test and the demonstration of a normal basal metabolism rules out hyperthyroidism, and emphasizes the likelihood of a focal infection, which may, however, be either tuberculous or non-tuberculous in character. The demonstration of increased basal metabolism is indicative of the presence of hyperthyroidism, and thus responsible wholly or in part, for the clinical condition. To a less exact degree the same suggestion is afforded by a positive Goetsch test.

The Goetsch test consists of the subcutaneous injection of about 0.5 cc. adrenalin after the patient has been kept at rest and is in as undisturbing surroundings as possible. With a positive result there is usually an early rise in blood pressure and pulse of at least ten points; in the course of 30-35 minutes there is a moderate fall, then a slight secondary rise which is succeeded by a secondary fall to normal in 1-1½ hours. Readings of blood pressure and the pulse should be taken from every 2½ minutes at the start to every ten minutes later. Attention should be paid to any accentuation of the symptoms referable to thyroidism obtained during the test, and compared with the findings previous to the injection.

IV.—The tuberculin test in adults is a method of demonstrating the degree of specific sensitiveness to tuberculin. This is not a clinical condition; it is an immunological state which it is believed can only be produced by the entrance or implantation of the tubercle bacillus, and the production by the invading microbe of a microscopic or gross lesion within the host.

The presence of this specific sensitiveness, that is, a positive reaction or test, means only that these events have taken place sometime in the past life of the individual; it gives no indication whether the resulting lesion is microscopic or gross, whether the bacilli have been killed, whether they are still alive though walled-off and non-active, or whether they are propagating and increasing the pathological involvement. It thus bears in the adult no correlation to the disease we call clinical tuberculosis. Despite this absence of diagnostic value it continues to be extensively employed, in connection with which the following points remain for consideration.

(A) Excluding the frankly and dangerously ill, does the absence of tuberculin sensitiveness, *i.e.* repeated negative tests, exclude tuberculosis? The answer is in the negative, although the combination of clinical tuberculosis of the type inferred and negative tuberculin sensitiveness is no doubt comparatively rare.

(B) Is the degree of reaction or sensitiveness indicative of the degree of specific resistance, or otherwise expressed, is the result of the test of prognostic value? Here again the answer is in the negative, although in this connection one may perhaps add that many tuberculous patients, who do well or achieve an apparent or real cure, provide striking examples of both very marked and very slight, or doubtful reactions, *i.e.* marked and minimal degrees of sensitiveness.

(C) If the test is used quantitively and it is found that a marked difference in the degree of sensitiveness is obtained after the lapse of a month or so, it is at least to be regarded with considerable suspicion. With this method there are, however, many pitfalls, and all sources of error should be excluded as much as possible.

The test can be made in different ways:—

(a) It can be performed cutaneously by which is meant that the degree of sensitiveness is judged by the extent of the local reaction, *i.e.* infiltration, hyperaemia, lymphangitis, and vesicle formation. By this method a general reaction will be induced with comparative rarity and it will not be severe. Either the intracutaneous method of Mantoux or the percutaneous method of v. Pirquet may be employed. The former method is less painful and lends itself to greater quantitative accuracy. 1/20 mg. of O. T. in 0.02 cc. is a very satisfactory dosage to employ, (i.e. 0.02 cc. of a 1/400 dilution of O. T.). It is not sufficiently strong to induce extreme reaction except rarely, and not too weak to miss slight degrees of sensitiveness. This intracutaneous dose quantitatively corresponds to a 10 cmm. amount of a 50% solution of O. T. by the v. Pirquet method.

The Wolff-Eisner-Calmette installation into the eye is to be condemned as too dangerous, and the ointment of Moro as inaccurate.

(b) The subcutaneous method. It is illogical to use this method unless one believes in the value of focal signs, *i.e.* those adventitious sounds heard over some area of the chest during the general reaction and interpreted as an activation in or about a tuberculous lesion. The effects of the subcutaneous injection are local, general, and focal. The present conception necessitates a general reaction, *i.e.* malaise and fever, before a focal reaction, *i.e.* in the area of disease, can be induced. The dosage necessary to cause a general reaction varies extremely with different individuals but can be gauged roughly by the degree of sensitiveness as shown by the intra- or per-cutaneous method.

V.—The auto-urine and auto-serum test[4]: The theory underlying this procedure is that any case with an active focus produces a tuberculin or a substance acting in a fashion identical with tuberculin. This tuberculin-like antigen is present in the serum and the urine of the individual during the time that his focus is active, and can be demonstrated by injecting intracutaneously properly prepared urine or serum into the patient's own arm; or in case he is not tuberculin sensitive (*i.e.*, is anergic), by injection into the skin of an allergic (*i.e.* tuberculin sensitive) case.

We know that a high percentage of normals and apparently non-tuberculous cases have tuberculous lesions which, however, can not be demonstrated. If this test when positive is truly dependent upon the conceptions upon which it is based, we must expect to get positive results occasionally in cases in which we can, for the moment at least, find no clinical confirmation. This is on the assumption that amongst all the individuals with lesions there must be a time when, so to speak, activity is beginning or ending. Continuous observation and repetition of the test must in such cases be relied upon as our guide as to treatment.

The reaction produced by tuberculin (intracutaneously) indicates a tuberculin sensitization as outlined in the preceding section. The reaction produced by injecting urine or serum into the case, which we already know is tuberculin sensitive, is taken to indicate that the individual (whose urine or serum was used) has an active focus owing to the assumption that the reaction was induced by tuberculin being present in the injected urine or serum.

VI.—Tuberculo-complement fixation: This is an adaptation to tuberculosis of Bordet's reaction of complement fixation. It has received increasing attention of late years. The value which has been attributed to it by different serologists and clinicians has varied extremely, a discussion of this is, however, beyond the scope of this short summary. The several features which seem of clinical importance might be grouped as follows: All types of proved clinical tuberculosis do not give positive tests. If a number of cases are followed for a considerable period of time it is found that in certain cases the test appears apparently for the first time during those stages which are to be regarded as in or approaching the classification of apparent arrest.

In contrast with this it is positive in a very high percentage of the cases which are frankly, even dangerously active. On account of the high percentage of positive results in this class of case a poor work tolerance value is suspected in those who give a strongly positive result. This would be a marked feature were it not for the many cases in which exactly the opposite result is obtained—although the test is usually not so strongly positive in these apparently arrested types.

In clinical normals from 10-30% give a

positive test—depending upon the source of the investigated material and the degree of end reaction which the particular laboratory will call positive.

Considered diagnostically, the positive test may be said to have about the same value in adults which the positive tuberculin test has in early childhood. As such it takes its place in the data upon which one bases one's final diagnosis.

VII.—The two remaining serological tests are the inhibiteur reaction of Calmette and the inhibitive reaction of Caulfeild. So far no independent investigator has reported his results with either test and on that basis both are to be regarded as in the experimental stage. The technique of each is different and would appear to rest upon fundamentally different factors*

Conclusions:—The examination of the sputum is a very simple procedure and can easily be carried out by the physician in his own office, or advantage can be taken of the different provincial or municipal health laboratories, which will supply bottles and containers ready for mailing, and report the result without charge. Likewise the test for albumin can be made by the physician in his own office.

The Goetsch test is easily made by the physician in the patient's home. The basal metabolism determinations require some apparatus and considerable experience for accurate results. Tuberculin tests can be harmful if given subcutaneously; the other methods are without this danger but any practical interpretation from the results should be attempted only by those who have had experience with the method and who are familiar with methods of diluting for exact dosage. The serological tests while very promising, must be done in thoroughly equipped laboratories in charge of experienced serologists. Practical interpretations are not advisable unless one has had a very considerable experience with a large number of cases on which both repeated tests and clinical observations have been made.

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*For details and summary of value of the serological tests, see Caulfeild, *Can. Med. Ass. Jour*, 1922, XII, 650.

Case Report

QUARTAN MALARIA

PERCY C. LESLIE, M.D.

Changtcho, North Honan, China.

The clinic of the spring, 1923, produced an unusual number of Chinese patients reporting with quartan malaria. This type is comparatively rare with us, but occurring out of the mosquito season when very few patients report at all with malaria, it was the more unusual. There are certain features of this type of malaria, which have interested us, and which are in contrast to the tertian forms, either benign or malignant.

I.—*The Paroxysm.* The history given was invariably one with a two-day interval between the paroxysms, as the initial condition, but as time went by—say a month without treatment—the interval usually was one of a day only followed by two successive days on which paroxysms occurred; occasionally the fever assumed the quotidian type and a paroxysm occurred daily. Frequently after a second month elapsed the paroxysms would revert to the initial form and occur with a two-day interval.

The patient's statements regarding his condition do not always correspond with the blood findings, for a patient who states that he only has a paroxysm every fourth day, will show in the blood parasites in two different stages of development which should have given a paroxysm on two successive days. A patient who thus reported and who came on his "off" day would sometimes be found to have a temperature of 102 or 103, with sporulating forms of the parasites in the red corpuscles. Apparently the paroxysm may become so slight the patient may ignore it entirely, while the subsequent or alternate paroxysm may produce unmistakeable symptoms.

One patient developed a chill when in the outdoor, and had a temperature of over 104; the patient, however, did not exhibit great distress and insisted on returning home some miles the same day. The condition during the paroxysm is nothing like what is seen during a benign tertian chill, where the patient is prostrated and entirely overcome.

II.—*The Chronicity.* Although most of our patients had suffered for six and even nine months, most of them reported that they had usually been able to keep at their daily occupations and few had ever been confined to bed. The disease was not considered to be of sufficient import to come for treatment when the attacks first occurred; it was only when they got tired of not getting better that they eventually came for treatment.

One does not see in these quartan cases, the anaemia that so soon characterizes the benign tertian, nor the cachexia that eventually marks the sub-tertian. The spleen has never shown marked enlargement, anasarca was not present in any of these patients. It is truly a benign type, persistent but not severe.

III.—*The Parasite.* The ring forms are larger than the benign tertian which in turn are larger than the sub-tertian, show more of the blue staining protoplasm with Romanowsky stain and a larger mass of chromatin. The half grown have always been round, oval or sausage-shaped, while the matured parasite is always round and completely fills the enclosing red cell. The regular outline of the quartan parasite is in marked contrast to the parasite of the benign tertian, where irregularity seems the rule and no two parasites assume the same shape. The pigment is much more plentiful and coarser than in the tertian, while the enclosing corpuscle does not show perceptible enlargement even when the parasite attains its full growth, nor does it assume the irregular outline so constantly seen with enlargement when the parasite of benign tertian inhabits the corpuscle.

In no case have we seen a mixed quartan and tertian infection.

IV.—*Treatment.* Quinine of course will give early relief, but to effect a cure treatment must be prolonged. The statement that "it is useless to look for a parasite in the blood after the patient has had quinine for twenty-four hours" is not true as regards quartan infection. any more than it is true of the crescent forms of the sub-tertian, we have seen it after many days of treatment.

By far the most effective method of quinine administration that we have tried is the intravenous injection of the hydrochloride, ten grains to the dose, repeated daily for three to five days when treatment by mouth may be resorted to. Quinine should be continued until four drachms, more or less, have been administered, according to the time and virulence of the infection. Iron and arsenic are useful as supplementary to the quinine.

The intravenous route we have found to be much more satisfactory than the intra-muscular, no local necrosis follows the administration, nor other local disturbance. The effect is almost instantaneous and a feeling of faintness or nausea may ensue; the patient should be kept in a recumbent position for at least half an hour after administration. Larger doses than ten grains may cause too great a reaction, and vomiting and prostration have followed the injection of fifteen grains.

Editorial

CANADIAN PHYSIOLOGISTS AT BRITISH CONVENTIONS

CANADA may well be proud of the position which representatives of her scientific research were given both at the International Physiological Congress in Edinburgh, and in the Section of Medicine at the annual meeting of the British Medical Association at Portsmouth. At the Physiological Congress the members who, as the *British Medical Journal* states, are more accustomed to lecture than to listen to lectures, did Professor Macleod of Toronto, the honour to give up the first session entirely to his story of the early attempts to obtain the hormone of the pancreas, and to a modest presentation of how Dr. Banting and collaborators in his laboratory finally succeeded in obtaining it. He described how Dr. Banting had taken advantage of the old observation that obstruction of the ducts of the pancreas was followed by degeneration of the cells of the acini by which the pancreatic juice is secreted, while the islets of Langerhans remained little affected. Physiologists had long been confident that the pancreas did produce a hormone; the difficulty was in obtaining it, for when an extract of the whole pancreas was made the hormone was destroyed by the trypsin-producing cells. It was to the enduring credit of Banting that by experiments of a different type from those of his predecessors he first obtained evidence of its existence and finally was able to obtain it in a comparatively pure state.

It was also to the credit of the Toronto experimenters that they unravelled the meaning of the convulsions which occur after the injection of insulin in an animal rendered diabetic by excision of the pancreas. These observers proved that the convulsions were not the result of the insulin itself, but were produced by a consequent deficiency of sugar in the blood and could be arrested by the injection of glucose.

At the meeting of the British Medical Association held in Portsmouth, the Section of Medicine also devoted a morning to a discussion of the effects of insulin, and its President, Sir Thomas Horder, after emphasizing the great value of the discovery asked the question whether it was likely that it will ever become possible to administer insulin by the mouth. From our present knowledge it appears that this is never likely to be a possibility. It was the destruction of the hormone by the trypsin secreted by the gland, that stood in the way of the earlier experimenters. and it is now known that insulin is also destroyed by pepsin. Another question asked by Sir Thomas Horder was whether there is any hope of the recovery of the islets of Langerhans in diabetics. While nothing definite can be yet said on this point, Professor Macleod mentioned the observation that islet tissue develops considerable powers of regeneration after much of it has been destroyed as a result of ligation of the secreting ducts of the gland; and in the course of the discussion, Dr. Poulton also made the statement that he had observed increased toleration of starches in three out of four mild cases. Dr. Banting's presentation of his own story was given very clearly and modestly, in an excellent voice audible all through the crowded hall, and was listened to with the greatest attention. The profession in Canada desire to acknowledge these characteristics in Professor Banting's address, and to congratulate him on the appreciation shown not only by the profession in England, but also by the King, of the great value to the world of the results obtained by his thoughtful and energetically pursued research, and on the announcement of his methods without any attempt to secure personal profit.

THE EFFECTS OF LIGHT ON THE BODY

THE action of sunlight on the surface of the body has been recognized for years; sunburn and snow-blindness are so well known that they require no comment. That light can produce any remote or general effect, however, has not been so fully realized, and it is only recently that this subject has received any clinical attention.

The study of light in its relation to life dates from the time of Downes and Blount, who before the Royal Society in 1877, reported that exposure to light retarded the growth of bacteria. Finsen in 1896 first directed general attention to the use of intense light in the treatment of diseases of the skin, notably those of tuberculous origin, and seven years later Rollier in the Alps began his studies of heliotherapy in the more generalized or systematic forms of tuberculosis. Recently his results have been published in book form, and have drawn attention to the remarkable effects of light upon the general metabolism of the body. In 1919 Huldschinsky[1] reported the cure of rickets by the ultraviolet ray. Following repeated exposure he was able to demonstrate by X-ray, increased deposits of lime salts at the ends of the long bones, and all symptoms of the disease disappeared within two months. Park, Howland, Hess and other observers have confirmed these findings and have added to the information regarding the exact chemical nature of these changes in the phosphorus and calcium metabolism which follow the use of ultraviolet light in the treatment of rickets.

Light varies in its effects according to the amount of actinic rays which it contains. Those who have had experience in photography will remember that the intensity of the image in the photograph varies tremendously according to the amount of actinic light present, that is the amount of light farthest removed from the red-orange end of the spectrum. Much of this light is invisible to the eye as its wave-length is too short to produce the light stimulation of the retina, just as in the study of sound certain notes have such a high frequency of vibration that they are inaudible to the human ear. These invisible ultraviolet rays have very visible effects on the skin, notably erythema and even blistering which follow relatively short exposures, be it to intense sunlight or to the light from one of the quartz mercury lamps.

Ultraviolet light also produces great changes in the circulation of certain organs. In experimental animals it causes a marked engorgement of the spleen, lungs, and liver, the spleen often being enlarged to twice or thrice its normal size. Other changes in the circulation and the metabolism have also been noted, and it becomes evident as Clark[2] says that the absorption of ultraviolet light by the body surface to the depth of only one tenth of a millimeter, results not only in an immediate or direct effect on the skin, but also in a distant effect on certain organs; this can be explained most plausibly by the production of some photochemical substance at the surface which is conveyed

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(1) HULDSCHINSKY, K., Heilung von Rachitis durch künstliche Höhensonne, *Deutsche med. Wochenschr*, 1919, Vol. XLV., p. 712.

(2) CLARK, J. H., Physiological Action of Light, *Physiological Rev.*, 1922, Vol. 2, p. 277.

to the internal organs by way of the blood.

To obtain the full action of ultraviolet light there must be a free passage of the rays from their source to the exposed surface. They have little or no penetrating power and a layer of skin 0.1 mm. thick suffices to absorb the most intense radiation. Many other substances absorb the rays and hinder their passage, for example, ordinary window glass stops a large proportion of the more active rays as evidenced by the lack of effect of sunlight on rachitic children in the ordinary solarium, or more popularly the slowness with which sunburn develops in patients exposed under glass. The ozone of the atmosphere also tends to absorb actinic light and hinder its passage. *Direct exposure is required to ensure satisfactory results in heliotherapy.*

The effects of ultraviolet light vary greatly according to the sensitiveness of each individual, the fair complexion being more affected than the dark, and this may be the explanation of the general trend of the lighter races to survive in the higher latitudes as compared with the greater resistance of the darker peoples under tropical conditions, where there is a greater incidence of ultraviolet light. So also in the animal world the changing colours of the hare and ptarmigan when exposed to the Arctic winter may not be so much a protective mechanism to make the animal less conspicuous, as an effort on the part of nature to make the fullest use of the limited actinic value of the polar light.

Besides the colouring of the individual, certain well known chemical substances have a definite power of increasing the effects of ultraviolet light. So called "buckwheat poisoning" in cattle is most interesting in this regard. Haematoporphyrin, a substance derived from haematin by the removal of iron, plays a startling rôle as a sensitiser to light. One observer with more regard for science than for himself, found after intravenous injection of 200 milligrams (gr. iiss) of haematoporphyrin that for weeks any exposure to sunlight caused a most alarming reaction characterized by restlessness, vaso-motor disturbances, and dyspnoea while he was quite comfortable when not in the sun. Haematoporphyrin is found in the urine of children in certain conditions, and pediatricians report the rapid formation of bullae if such patients are exposed to light, and also systemic reactions very similar to that described above. This then is an example of naturally occurring haematoporphyrin sensitization.

The bactericidal action of ultraviolet light has recently been made the subject of exact study by Bayne-Jones and Van der Lingen[3] and they find again that the visible rays of the spectrum have little influence on bacterial growth, but that the light with the shorter wave lengths is absorbed by the bacteria and has a very destructive action. This activity is greatly increased by raising the acidity of the media in which the bacteria are exposed.

There can be no doubt that actinic light has a great influence in the metabolism of living matter, but the application of light to the treatment of disease is still in its infancy. Up to the present the chief positive results have had to do with surface effects in diseases of the skin and with the deposition of calcium and phosphorus in the bony framework. In tuberculosis of the bones Rollier's plates show the most remarkable changes following exposure of the body to sunlight, and it seems that these changes are proportional to the degree of pigmentation of the skin. He states that phalanges which have entirely disappeared to x-ray examination, may be recalcified so completely as to be indistinguishable in radiographs from normal bones. Adults seem

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(3) Bayne-Jones, S. and Van der Lingen, Bactericidal Effect of Light, *Bull. Johns Hopkins Hosp.*, 1923, Vol. 34, p. 11.

to be as easily affected as children. So also in tuberculous sinuses and ulcers, in glands of the neck, in pleural and peritoneal effusions, ultraviolet light has a most beneficial action, and his statistics seem to bear out these claims. Similar beneficial results are claimed in tuberculosis of the lungs, but here the pulmonary congestion noted in animals shows itself again in the increased tendency to haemorrhage which is seen in certain patients following heliotherapy.

The more recent studies of Park, of Hess, and of other observers on the effects of light on rickets have shown that the calcium metabolism undergoes a marked change. Skiagraphs of the bones show a rapid deposition of calcium, and in spasmophilia the stridor rapidly diminishes following exposure to light. This replacement of the vitamine of cod liver oil by an undoubted physical agent throws open a wide field of conjecture as to the actual rôle played in nature by the accessory food factors.

It is safe to say that the study of light and its action on the normal and pathological metabolism of the body will occupy an increasingly important position in the realm of medical research in the next decade. D. S. L.

LACTIC ACID PRODUCING ORGANISMS

RECENT clinical experience with the use of milk artificially soured by inoculation with lactic acid producing organisms, has revived the interest in this subject aroused by Metchinkoff's book *The Prolongation of Life.*[1] Among others, the theory that Metchinkoff propounded was, that many human ills and premature senility, were in a large measure due to auto-intoxication from the large bowel, that this intoxication was due to a toxin liberated by certain forms of bacterial life inhabiting and multiplying in the intestine. Finally he thought that the digestive tract could be freed from these pathogenic forms by the use of lactic acid producing organisms given by mouth in milk, which destroyed the toxin producing organisms by their implantation and growth, while they themselves and their products were innocuous. The bacillus used by Metchinkoff was *B. bulgaricus* in milk cultures.

Shortly after the appearance of Metchinkoff's work, Herter[2] of New York fed large amounts of *B. bulgaricus* in milk, to a monkey, to show that the intestinal flora could be altered by the growth of *B. bulgaricus* in the intestinal canal. He found that, although lactic acid was present throughout the digestive tract, below the ileocaecal valve, the regions characterized by most active putrefaction and toxin production according to Metchinkoff, the lactic acid producing organisms failed to establish themselves in relatively large numbers; that is, the supposedly toxin producing organisms of the caecum were not ousted by the ingestion of cultures of *B. bulgaricus.*

In a recent article,[3] however, experimental evidence is produced to show that Metchinkoff was in reality dealing with *B. acidophilus* and not *B. bulgaricus*, and workers at Syracuse University[4] have demonstrated that the intestinal flora in man can be definitely altered by the feeding of *B. acidophilus* milk cultures, with a displacement of the putrefactive organisms from the large intestine. The use of these cultures in the treatment of chronic constipation, auto-intoxication, intestinal toxaemia, mucous colitis, and sprue has yielded remarkably good re-

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(1) Metchnikoff, S., *The Prolongation of Life*, N.Y., 1907.

(2) Herter, C. H., *J. Biol. Chem.*, 1908.

(3) Cheplin, H. A. and Rettger, L. F., A treatise on the transformation of intestinal flora, New Haven, Conn., *Yale Univ. Press*, 1921.

(4) Cheplin and Rettger, *B. acidophilus* and its therapeutic application, *Arch. Int. Med.*, 29 Mar., 1922.

sults in the cases reported by several writers.[5] These good results consisted in normal bowel movements, gain in weight and strength, and absence of symptoms of intoxication. According to Cheplin, Fulmer and Barney[6] the beneficial effects in simplifying the complex fecal flora by the daily ingestion of a litre of *Bacillus acidophilus* milk are manifested in two ways, (1) In the constipation group the physical characteristics of the feces are changed, becoming yellowish, soft, comparatively odourless resembling the infantile type of stool, elimination of pain and straining at stool follows also. In the diarrhoea and mucous colitis group there is a gradual formation of the fecal material, finally resulting in soft, light, and partially formed stools with a complete disappearance of the mucus. (2) Marked improvement in the clinical picture by relieving the toxic symptoms which previously existed.

If the conclusions of these workers are accepted, there is open a large field of gastro-intestinal disorders for treatment and investigation along this line, not only those cases which may be classed as intestinal intoxication, colitis, and constipation, but also the acute specific infections such as typhoid fever and dysentery. It has already been shown[7] that administration of lactose to typhoid fever patients shortens the course of the disease, conserves the body weight and produces a definite change in the intestinal flora, with the production of one similar to that found after the ingestion of *B. acidophilus.* It is quite possible that the implantation of this organism in the digestive tract might, by its growth and multiplication, inhibit the growth of *B. typhosus.* It has also recently been suggested[8] that the digestive tract may be the origin of some obscure cases of arthritis and iritis; that due to a damaged intestinal wall certain organisms gain entrance to the blood stream and set up inflammation by localizing in the affected areas. The ingestion of *B. acidophilus* would possibly prevent these intermittent blood stream infections from the bowel, by permitting nature to repair her damaged defences by the removal of certain pathogenic organisms from the digestive tract.

It is not definitely known whether the beneficial effects produced by the feeding of *B. acidophilus* milk, or milk soured by other lactic acid producing organisms, to athreptic infants, are due to the presence of the organisms themselves, or to the lactic acid produced by them. However, the latter would appear probable since the addition of commercial lactic acid in proper proportions to sweet milk, produces equally good results in infant feeding,[9] apparently by the neutralization of the "buffer" of ordinary cow's milk. The effect on the infantile intestinal flora, of the feeding of *B. acidophilus* has not been brought out.

However, it would appear that, although the feeding of *B. acidophilus* may not be the "fount of immortality," as Metchinkoff's *B. bulgaricus* was for a time thought to be, it has a definite place in the therapy of constipation and even more particularly in those cases of intoxication due to absorption from an unhealthy digestive tract, unhealthy because of the presence of pathogenic putrefactive organisms.

R. R. S.

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(5) Cheplin, H. A. and Wiseman, J. I., Observations on the effects of Acidophilus Milk upon cases of chronic constipation, *Boston M. & S. J.*, 185, Nov. 24, 1921. Gampertz, L. M. and Varhous, M. G., Observations on *B. acidophilus*, *Med. Rec.*, 100, Sept. 17, 1921. Bacteriological and clinical experience with *B. acidophilus*, *J.A.M.A.*, 80 (Jan. 13), 1923. Norman, N. P. and Eggston, A. A., Pyogenic infections of the digestive tract and their biological treatment, *N. Y. M. J.*, 115, Apr. 19, 1922.

(6) Cheplin, H. A., Fulmer, H. C. and Barney, C. O., Studies on the therapeutic action of *B. acidophilus milk*, *J.A.M.A.*, June 30, 1923.

(7) Torrey, J. C., The fecal flora of typhoid fever and its relation to various diets, *J. Infect. Dis.*, 16, 1915.

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Editorial Comment

LABORATORY AND HOSPITAL

"Research work" and "scientific" are terms which to the laity generally connote work carried out by the aid of the microscope, with test tubes or glass retorts. Such an idea is only a half-truth and perhaps even by some in the medical profession is accepted as the whole truth. Medicine is still in need of men of great powers of observation in the wards or out-patients' department, who like Sydenham can picture for us the symptoms and course of a disease, in short its natural history. Such men even if they only recognize and make plain a new symptom-complex add much to science and are entitled to the same rewards as the laboratory worker.

Sir Berkeley Moynihan has lately written a letter to *The Times* on this subject which we quote in full.

"The leading article in *The Times* of July 25 calls attention to a truth which lacks adequate recognition. Clinical research and the toilsome discoveries of new technical methods are as fully entitled to the term "scientific" as any of the good work done in our laboratories. The complexities of clinical research are so intricate, and because of the human material upon which they are conducted are so bewildering as perhaps to surpass all forms of laboratory research in difficulty. They call for qualities of insight, imagination, patience, and intellectual integrity to a no less considerable degree. The practice of clinical medicine or surgery makes a further heavy demand upon qualities of temperament and of character which are little exercised in the cloistered tranquillity of the laboratory. Yet the rewards open to the clinical investigator by the only scientific body competent to give them, the Royal Society, are consistently withheld. The present President of the Royal Society is a medical man whose life has been spent in the laboratory, with the result that physiology and general medicine have been permanently and very greatly enriched by his labours. But there are physicians and surgeons whose lives have been spent in the wards and in the operation theatres of our hospitals whose contributions to 'scientific' medicine are entitled to rank even with his. The joint and separate labours of the laboratory worker and of the clinician are both, perhaps equally, necessary for the future progress of medicine in all its branches. Both are deserving of recognition at the hands of those empowered to confer it; in 'scientific' value one does not surpass the other."

The Canadian Tuberculosis Association held its annual meeting in June at Edmonton. Following on this, it has collected and put together for distribution all the addresses and papers then read. No more admirable method could be adopted for the spreading and rendering more permanent continuation of the influence which such a meeting represents. To look through these papers will make one feel much of the enthusiasm and appreciate the unfaltering efforts which have characterized the work of the Association.

The address by the retiring president emphasizes the importance of the public backing their efforts; and this can be obtained only by continually showing the people the results of the work done by the Association, and the need for doing much more. A fine incentive to further work too, is given in the account by Dr. Parfitt of the evolution of the sanitarium in Canada. The Association may well be proud of the results obtained in Canadian Institutions during the last twenty-five years. The more strictly clinical aspects are treated in a series of papers which gain greatly in value because of their practical nature and their clearness in statement. The following subjects are discussed in some of the papers presented at the meeting, and deserve careful attention: The detection of incipient disease; The association of tuberculosis with cardiac disease, by Dr. Ferguson of Fort Qu'Appelle; The conclusions deducible from an analysis of 175 case histories, by Dr. Boughton of the same sanatorium. There is also a review of the methods and means of diagnosis in Montreal clinics by a French colleague, written in much-to-be-admired English.

Other papers of an important character are, Tuberculosis from the point of view of the medical officer of health, by Dr. Arthur Wilson of Saskatoon; Bovine tuberculosis in relation to public health, by Dr. Torrance, Veterinary Director General, and Tuberculosis in connection with immigration, by Dr. D. A. Clark, Department of Health, Canada.

For the teacher no aspect of the subject presents more difficulty or is in need of more earnest thought and effort than that dealt with by Dr. D. A. Stewart in his paper on "Teaching about Tuberculosis." He dwells on the depressing infrequency with which the really incipient case is seen at the sanatorium. The teaching, he says, must radiate from the sanatorium, and teachers must be enthusiasts, for "torches are not lighted at icebergs." Tuberculosis should be a subject on the programme of every medical convention and society.

A final group of papers, read before the Provincial Health Officers' Association of Ontario, makes an excellent symposium on tuberculosis in children.

The Manitoba section of the American College of Surgeons held its meeting in Winnipeg on September 10th and 11th. Opening with a clinical address by Dr. Chas. H. Mayo, there was a full and varied programme, covering a hospital session in the morning, with Dr. D. S. Mackay of Winnipeg in the chair. After several excellent addresses by American confrères from Chicago, Rochester and Battle Creek, Dr. McMillan of Winnipeg spoke on the organization of an x-ray department; Dr. Fred. C. Bell on the essentials for good case records, and Dr. Boyd on Pathology in the Hospital. The annual meeting of the Fellows of the College was held in the afternoon, and a public Community Health meeting in the evening. The second day was taken up with hospital clinics held in St. Boniface Hospital, and a scientific session held in the Fort Garry Hotel.

We have received Bulletin No. 3 of the Medical Society of Nova Scotia. It is a publication which represents much energy and enthusiasm, and while there is in it an appeal from the associate secretary for more support, the quality of this particular number is a matter for congratulation. In bringing together reports from the various societies, associations and hospitals of the province, the Bulletin has a large field to cover. There can be no doubt that it performs a function of great value to the practitioners of Nova Scotia. A good many matters are discussed of local interest, but also many of general interest to the profession. The latter we would be glad to have discussed also in our *Journal*. To secure this we will be glad to print letters from individual members or from officials of the Medical Society of Nova Scotia.

The St. John Ambulance Association issues from its head office in La Banque Nationale Building, Ottawa, first aid bulletins. These give notice of the various activities of the Association, with news items from the provinces, and must prove of interest to members of the Association throughout Canada.

The Manitoba branch of the Tuberculous Veterans' Association has published an annual, with the object they explain, of assisting in the fight against the disease, of correcting false impressions, and of helping those who have tuberculosis. While in no sense a scientific publication, this booklet will serve an excellent purpose, and will aid materially the attainment of the objects proposed.

The Association

FINANCES OF THE ASSOCIATION

Acting upon the resolution of the Annual Meeting in June last, 20 One-Hundred-Dollar Bonds have been drawn by lot for redemption on October 1st.

The serial numbers of bonds so selected are, 5, 15, 21, 36, 45, 51, 71, 74, 78, 81, 84, 98, 116, 120, 126, 130, 132 133, 144, and 161.

Holders of these bonds have been notified by letter to draw upon the Association through the Bank of Montreal, Peel Street Branch, Montreal, attaching the bond for redemption to the sight draft.

Men and Books

ABRAHAM GESNER

In Campbell's *History of Nova Scotia*, a reference is made to Dr. Abraham Gesner, who was born towards the end of the eighteenth century at Cornwallis, Nova Scotia. Dr. Gesner's father was a native of what is now the State of New York, but fought for England in the Revolutionary War, and lost all his property in consequence of his loyalty to the throne. After the war Colonel Gesner removed to Nova Scotia, where some years later Abraham was born. In early life young Gesner explored the West Indies and South America rather extensively to enlarge his opportunity for the study of natural history. In these travels he was twice shipwrecked. He then went to England, where he pursued his medical studies under such authorities as Abernethy and Astley Cooper. Apparently, however, he did not devote much time to medical practice, as we find that he was attached to a geological survey party in New Brunswick from 1835 to 1842. By this time he had collected quite a museum of natural history, which he presented to the Mechanics' Institute of St. John. Later he accompanied Sir Charles Lyall on a geological tour through Nova Scotia.

His chief claim to distinction lies in his discovery of kerosene oil, and of the means of extracting it from coal and other bituminous substances. He established two large oil-manufacturing plants in New York, and succeeded in marketing his products in many parts of the world. He wrote extensively, mainly on scientific subjects, his works being characterized by lucidity and soundness. He died at Halifax in 1864. W.H.H

Scientific Nutrition.—"A few years ago it was customary to compare the human body to an engine, and the food to the fuel which is consumed in making the engine go." To-day it is better "to liken the nutrition of the body to some complex process of manufacture in which chemicals are used." It is important to have the right chemicals in the right proportions. This is from the second article by Dr. E. V. McCollum in the June issue of *Hygeia* and he supports his assertions by the results of the comprehensive studies on animal feeding that have been going on everywhere. All proteins do not have the same value; vitamin-containing materials are necessary and the proportion of the different food constituents must be correctly arranged. Dr. McCollum insists that the average American eats plenty in actual quantity but takes insufficient milk and green vegetables, especially those eaten raw. These are far superior to cereals, potatoes and other roots.

Correspondence

BRITISH MEDICAL ASSOCIATION ANNUAL MEETING

The following interesting letter has been received from Dr. A. D. Blackader, Editor of the *Journal*.—Assist. Editor.

The ninety-first annual meeting of the British Medical Association was held this year in Portsmouth during the fourth week in July, and must be regarded in every way as a success. More than one thousand members were in attendance, among whom were representatives from every part of the Empire, indicative of the Imperial character gradually being assumed by the Association. The three aims of the Association: the promotion of medical knowledge, the maintenance of the honour and higher interests of the profession, and the fostering of a feeling of good fellowship among its members, were all notably forwarded at the meeting.

The opening address by the President was an able presentation of the necessity of obtaining good sanitary conditions with abundance of sunlight and fresh air for the development of healthy life in every home. The dual position held by Mr. Childe in Portsmouth as Senior Surgeon to its chief hospital, and Chairman of the city's Health and Housing Committee specially fitted him to speak on this subject and to emphasize the disastrous influence of bad environment on the homes of the poor, especially such as exist in the slum areas of industrial centres where overcrowding, defective hygienic conditions, and deficient, or almost total absence of, sunlight have a most deteriorating effect on both health and morals, and greatly favour the development of endemic disease, especially tuberculosis, rickets, venereal disease, and alcoholism. Only a passing reference was made to cancer as it must at present be regarded as a disease of which as yet little is known. The inclusion of alcoholism as a disease might by many be questioned. It must be acknowledged that it is also a vice; yet notwithstanding its moral aspect it must be regarded in a great number of cases as a disease fostered by unfortunate environmental conditions in the home and family. While the endeavour of America to cure the evils due to alcoholism by compulsion is watched by the profession in Great Britain with interest, the better way, in the opinion of the speaker, was to strengthen the character of the people by improved living conditions and to remove the many ever-present temptations to drink. While the prevention of tuberculosis by the installation of healthy dwellings, with a greatly increased amount of sunshine in both home and workshop is to be preferred to treatment in costly sanitoriums after it has developed, nevertheless both are demanded at the present day, and it is probable that for many years yet we will have to deal with its end products as well as with its active and predisposing causes. Mr. Childe made reference in passing to the part played by coal smoke in lessening the amount and the effectiveness of sunshine, and to the possibility and great desirability that in the near future some definite abatement of this harmful nuisance in large cities may be effected.

In reference to rickets the President called attention to its disabling results and to the prompt improvement which takes place under improved hygienic conditions, proper dietary, fresh air, and sunlight. Mr. Childe also emphasized by quoting from reports of the health officer of Glasgow the shockingly evil results of the overcrowding which occurs in the slum districts on the standards of morality and the frequency of venereal disease. The industrial revolution which took place in the last century accounted in great part for the urbanization of the population and the herding together of thousands of workers in the centres of industry. Shorter hours of work and more rapid means of conveyance now permit the worker to live at a distance from his work. Air space and sun space around a house are of more importance than its size or than the presence in it of a parlour rarely used. While the environment of the homes of the wage earning classes in our industrial centres may in part be a sociological question, it is inseparably linked up with, and is in fact the greatest of, all our problems of preventive medicine, and it is up to the medical profession individually and through its societies to educate public opinion on the urgent necessity of fresh air and sunlight in homes and workrooms.

In the scientific and clinical sections many interesting papers were presented and were followed by valuable discussions. In the Section of Medicine a discussion on diabetes and insulin occupied the first day. The President, Sir Thomas Horder, Bt., in his opening remarks stated that diabetes at present must be regarded as the result of several biochemical disturbances; the administration of insulin in his opinion might be of service in marking off the different types of the disease. Insulin was undoubtedly the greatest contribution made to the study of diabetes, but it was doubtful if it would solve all problems in its treatment.

A very hearty welcome was extended to Dr. Banting who detailed the story of his successful research and gave exact directions for using insulin if the best results were to be obtained. A general discussion followed the reading of his paper. Dr. Graham of London, said that sugar tolerance in his experience could to a certain extent be recovered under treatment. An important point in the treatment was to make certain as to whether the blood sugar was normal in the morning before the dose of insulin was given. No carbohydrate, except that present in vegetables should be added to the dietary till the morning blood sugar had been normal for three or four weeks. In closing the discussion at the request of the President, Dr. Banting stated that continued treatment was necessary in severe cases: patients, however, could be trained to give injections to themselves. Larger doses were always necessary at the outset of treatment. It was easier to treat a long-standing elderly diabetic than a young and early case. As an increase in blood sugar stimulated the pancreas it was desirable to maintain the blood sugar as nearly as possible at its normal level. The more frequent and prominent symptoms of hypoglycaemia were trembling of the muscles with a feeling of uneasiness or of impending disaster, and in children, pallor, increased frequency of pulse and sweating. These symptoms may be followed by a feeling of hunger and sleepiness, incoherent speech, and coma. Adrenaline (min. x.—min. xv, hypodermically) would usually render a comatose patient conscious owing to its rapid action in the mobilization of glycogen from the liver. This must be followed by giving glucose. If the patient were sufficiently conscious he should be given 10 to 20 grams of glucose by mouth.

In all the sections the papers read were of a high class and were presented in an interesting manner. Abstracts of all will appear as promptly as possible in our *Journal*. Of special interest to the writer was the paper on the nervous child read by Dr. Hector Cameron, of London, in the section of neurology. Dr. Cameron began by drawing attention to certain physical characteristics of which the more important were a deficiency in muscular tone giving rise to a peculiar stance with some lordosis and a protuberent abdomen and pallor due to a vaso-motor anaemia. Such a child was apt to suffer from enteroptosis and constipation and from attacks of abdominal pain liable to be mistaken for appendicitis. Catarrhal affections with irregularities in the temperature chart were not infrequent. The origin of many of the nervous symptoms was often found in a study of the parents' dealing with the child. The young child was highly suggestible, quick to catch and to make use of any anxiety aroused in the family by its ailments. The desire to attract attention and of self-assertion was a common symptom which might lead to acts of a distressing character. These children often displayed a strongly negativistic attitude well exemplified in certain cases of anorexia nervosa. Many of these symptoms could be traced to faulty management on the part of those in charge. Suggestions made by mother or nurse often caused much difficulty, and in the treatment of such cases the home life of the child must be carefully studied. Sir Robert Armstrong Jones of London, recalled the pedagogic maxim of "Don't say don't" and emphasized the importance of sleep for such children who should be made to sleep for nearly twelve hours out of the twenty-four.

At the annual meeting of the representatives of the various branches which took place a few days before the general meeting there were present the following delegates from the Overseas Dominions:—The Hon. W. E. Collins, M.D., and Dr. R. C. Begg (New Zealand),

Major-General Sir Gerald Giffard (Madras), Colonel Ashton Street (Bombay), Sir Joseph Verco (South Australia), Dr. A. C. Lankester (Central Provinces), Dr. E. C. Dean (Western Australia), Dr. John Hutson (Barbados), Dr. F. J. A. Beringer (Sierra Leone), Dr. J. A. R. Glennie (Singapore), Dr. J. V. Manning (Orange Free State), Dr. E. P. Baumann (Transvaal), Dr. G. W. B. Daniell (Cape of Good Hope), Dr. O. Marriott and Dr. G. Duncan Whyte (Hong Kong and China), and Dr. L. E. Ellis (New South Wales). Canada, it will be noted, is the only important Dominion unrepresented.

The following overseas representatives on the recommendation of the Council were made Vice-Presidents of the Association: Mr. George Adlington Syme, M.S., F.R.C.S., of Melbourne; Dr. Robert Henry Todd, of Sydney; Dr. Harry Edward Gibbs, of Wellington, N.Z.; Dr. Wilfred Watkins-Pitchford, of Johannesburg, and Dr. Dugald Campbell Watt, of Pietermaritzburg, S.A. It was also stated that the Council considered themselves fortunate in having persuaded Sir William Macewen to undertake the office of ambassador of the Association to the Australasian Medical Congress and that he would go out in September. In this connection we may quote from the speech of Sir Joseph Verco, who responded on behalf of the oversea branches to the toast of the British Association at the annual dinner, "I desire here to announce the loyalty of my own and of all the Australian branches of the Association.. We are pleased that the Council has granted them all individual incorporation. I have pleasure in stating that we all consider that we have all possible liberty. We have our own Journal, our own buildings, our own banking account, our own federal committees, our own professional rules and regulations, and at the same time we may rely on the assistance and advice of the parent association whenever they may be requested.

ANNUAL MEETING OF THE COLLEGE OF PHYSICIANS AND SURGEONS OF THE PROVINCE OF ALBERTA

To the Editor:

The College of Physicians and Surgeons of the Province of Alberta a year ago amended their by-laws providing for an annual meeting of the members of the College when the President would review the work of the Council during the year and receive from the members of the College any comment or suggestions they might feel free to give. In accordance with this provision, the annual meeting of the College was held in Calgary, September 6th, 1923.

One question that was up for discussion was the question of contract practice. According to the code of ethics "It is unprofessional for a physician to dispose of his services under conditions that make it impossible to render adequate service to his patient, or which interfere with reasonable competition among the physicians of a community. To do this is detrimental to the public and to the individual physician and lowers the dignity of the profession."

Notwithstanding this, contract practice is prevalent throughout the Dominion of Canada, and it is felt that the time has come to make a definite pronouncement on what kind of contract practice and under what conditions permission will be given medical men to enter. It was felt that the only place where there was an excuse would be in isolated mining or lumber camps, but in large towns and cities, railroad employees, lodge members, workers in factories, etc., should not be limited to a certain individual doctor or a small limited group, but they should have their freedom of choice to choose whomsoever they may wish.

It was felt that there should be some system of Dominion registration by which doctor's records could be kept in some central office so that men found guilty of violation of the laws in one part of Canada would find it more difficult to register in another and continue their similar conduct.

The Workman's Compensation Act came up for consideration and it was felt that it would be better to have a medical Board of Appeal appointed by each Workman's Compensation Board who would handle important questions in dispute and on whose report the Commissioner would grant compensation or remuneration for medical aid. Accidents sometimes resulted in fatal disease, families were deprived of the assistance of the father. The question, therefore, was of great moment to the widow whether the disease followed the accident and she would receive compensation or not.

The Council of the College of Physicians and Surgeons of Alberta met during the first week in September and erased the names of two men from the register who had been found guilty of illegally prescribing narcotic drugs. They considered two applications from men transferring from other provinces and refused to register them because from government reports they had been guilty of violating the laws of the country and of unprofessional conduct. The Alberta Council has gone on record that they are going to use severe measures in future in dealing with all men who deliberately and knowingly violate the laws of the country.

The question of hospital interns was discussed and as these are not used in this western country, a special committee is being appointed to investigate the whole question with the University, the Alberta Hospitals Association and the Medical Council of Canada. They will confer with Manitoba University as well with a view to agreeing on a basis for Western Canada *that will be comprehensive in character.*

The Council went on record also that pressure should be brought to bear on the Medical Council of Canada to reduce the fees for registration from $100.00 to $25.00 to all members of the profession who were entitled to registration without examination by virtue of the ten years' practice clause. It seems unreasonable that a medical practitioner who has his provincial license by examination is able to get his British Registration for £5, which gives him access to every province in Canada barring British Columbia, as well as the British Empire outside. Yet in order to get a Dominion license, which includes all Canada, a $100.00 fee must be paid. The various Medical Councils in the provinces of Canada are to be asked to consider this phase of the question and see if something can be done.

W. G. Hunt,
Ass't to Registrar.
Calgary, Sept. 19, 1923.

The Favorable Prognosis of Auricular Fibrillation.—In a group of thirty-seven patients with auricular fibrillation, whose cases are reported briefly by T. Homer Coffen, Portland, Ore., about three-fourths are ambulatory, while one-fourth have died. Half of the entire number are comfortable and able to carry on their daily activities without cardiac symptoms. Some of these have decreased reserve on unusual effort. About one-fifth of the entire number have more marked limitation of cardiac reserve, and while ambulatory, are more or less incapacitated. Most of these have needed digitalis at one time or another, or have learned how to use it to safeguard the heart. The heart is able to adjust itself to auricular fibrillation, and to compensate as it does in valvular lesions. When both fibrillation and valvular lesions (or cardiosclerosis) are present it may still compensate well for months or years, the prognosis depending on the sum total of symptoms and signs which largely indicate cardiac function. Evidences of myocardial weakness are largely clinical, but changes in the Q-R-S-T complexes, in repeated electrocardiograms, aid in measuring the progress of degenerative changes.—*Jour. A. M. A.*, Aug. 11, 1923.

The Classification of Heart Pain.—Heart pain is classified by P. D. White and J. E. Wood, Boston, as follows: 1. Simple fatigue pain: (*a*) Chronic hypertension; (*b*) aortic stenosis or regurgitation; (*c*) mitral stenosis; (*d*) pulmonic stenosis—congenital heart disease: (*e*) adherent pericarditis; (*f*) paroxysmal tachycardia or paroxysmal auricular fibrillation or flutter; (*g*) permanent auricular fibrillation or flutter with high ventricular rate, and (*h*) permanent coronary narrowing due to arteriosclerosis. 2. Nervous heart pain, including effort syndrome. 3. Paroxysmal heart pain (probably of coronary disease or irritability), the so-called true angina pectoris. 4. Pain of coronary thrombosis. 5. Aortic pain, of syphilitic aortitis and aneurysm. 6. Pain of pericarditis. Frequently, combinations of these factors occur.—*Jour. A. M. A.*, Aug. 18th, 1923.

Abstracts from Current Literature

MEDICINE

Splenic Anaemia: A Clinical and Pathological Study of Sixty-Nine Cases.

Chaney, W. C. *Amer. Jour. Med. Sc.*, June, 1923. Vol. 165, p. 856.

Chaney's report is based on a study of sixty-nine cases of splenic anaemia on whom splenectomy was performed at the Mayo clinic between November, 1905, and September, 1920. These cases belonged to the group described by Osler as "primary splenomegaly with anaemia" Rolleston considering them separately as chronic splenic anaemia and a terminal stage "Banti's disease" proper in which ascites has developed.

Pathologically, the spleens removed, showed a generalized fibrosis. The average weight was 1,000 grams (over eight times normal). The spleen tends to maintain its shape and is very firm and resistant to cutting, but there is no special diagnostic feature. There did seem to be a tendency towards reduction in the size and number of the Malpighian corpuscles with the increasing fibrosis, and for the central artery to become eccentric.

Clinically, the disease had existed for an average duration of seven years prior to splenectomy. The patients varied in age from two and one-half years to sixty-nine years, the average age being thirty-three years and the sexes being equally divided. The symptoms chiefly complained of were mass in the upper abdomen, haemorrhage from the stomach, and weakness. Of less importance were pain, indigestion, and diarrhoea. Gastric haemorrhage often alarming, with or without melaena, was present in two-thirds of the series. Pain seemed to be due not infrequently to a perisplenitis, occasionally evidenced by a friction rub. In thirty-three cases marked perisplenic adhesions were found.

The size of the spleen at operation as compared with the clinical findings was interesting. Spleens described as "just felt" were about 400 to 425 grams.; one inch below the cortal border, about 520 grams; and where the spleen reached to the level of the umbilicus and extended to the midline, the weight was generally about 1,000 grams.

At operation, thirty patients were found to have definite hepatic cirrhosis. In only thirteen of these was the liver larger than normal. The size of the liver seemed to have no relation to the size and weight of the spleen. Ascites was present in twenty-three cases with cirrhosis.

In the sixty-nine patients, the average red blood count was 3,700,000, the haemoglobin 53% and the leucocytes, 4,990. Anaemia of the secondary type and leucopenia were the rule; variation in size and shape of the red cells being noted in half the cases, with normoblasts in twelve cases.

After operation there was noted a progressive increase in the leucocyte count—to above normal about the forty-fifty day—then a decline to normal in about seventy-five days. There was improvement in the haemoglobin and the red count but no sharp conclusions could be drawn. The coagulation time and the fragility tests were normal, and the Wassermann reaction and stool examination were negative.

In practically none of all the sixty-nine cases where the liver was examined was the tissue normal. In thirty cases (the average age of these patients being thirty-five years) showed a definite cirrhosis. The chief complaints were essentially the same as those without cirrhosis. Jaundice was noted twice. Twenty-four of these cases with cirrhosis presented ascites, in ten of which it was noted before the operation. The mortality after operation was higher in those in whom a marked cirrhosis existed, especially when associated with ascites.

A. T. Henderson

The Clinical Criteria of Activity in Pulmonary Tuberculosis.

Ringer, P. H. *Am. Jour. Med. Sc.*, May, 1923.

It is often difficult to answer the questions whether any patient has *active* tuberculosis or whether the disease is *more* active or less active than on previous examination. Ringer has given us a very common-sense paper on this problem. Many are the definitions of activity but probably the best of those presented by the author are: "Tuberculous disease as opposed to tuberculous infection," or; "Evidence of poisoning, local and general, by the toxins of the tubercle bacillus."

Only a few of the most important points can be given here. In regard to the X-ray, Ringer thinks it is of great diagnostic aid as corroborating other pathological evidence or merely suggestive symptoms. He says the X-ray will almost invariably shame the examiner's fingers and ears but the plate presents a pathological picture rather, and ordinary methods of physical examination a clinical one. Shadows of peribronchial thickening, or even "cotton-ball shadows" of various sizes in the presence of other signs of activity, indicate active disease; in the absence of other signs of activity these X-ray signs must not be disregarded but taken seriously; we cannot say there is no active trouble and simply must keep the patient under careful supervision.

Ringer finds it important even at this date to emphasize the fact that basal râles are of infinitely less importance than apical râles. He also states that, although as a general rule moist râles can be distinguished from dry râles, in the case of borderland sounds the personal equation plays such a part that an absolute standard is not obtainable. And, of course, it is the moist râles that indicate active trouble. Pleuritic friction plus other evidences of illness is a very important physical sign.

It is possible for patients with a quiescent lung lesion doing a full day's work to expectorate only a minute quantity of sputum per day or per week which always shows tubercle bacilli. "If such individuals are to be classed as 'active' cases, they have at any rate achieved an economic recovery which is the great goal of all the tuberculous and the question of 'activity' becomes one of merely academic interest." In the author's opinion, neither the Arneth differential count of the leucocytes or the serum complement-fixation test can as yet tell us accurately whether the lesion is active or not.

Ringer lays greatest stress upon a study of symptoms to tell us whether the lesion is active or more or less active; for the man doing general work the symptoms must be considered which alone can determine the relative strength of the invading parasite and the powers of resistance in the invaded host. The physical signs may not decrease but remain stationary, yet the symptoms and the ability of the patient to take more exercise speak plainly that the disease is less active. ARCHIBALD MALLOCH

Metabolic Studies in Pernicious Anaemia. Gibson, R. B., and Howard, C. P. *Arch. Int. Med.*, July, 1923. Vol. 32, p. 1.

Studies on eleven cases of pernicious anaemia are reported with, for comparison, similar observations on four cases of anaemia not of the Addisonian type.

In general, the authors found that the patients did well on a diet of fruits, green vegetables, lima beans, sweet potatoes, egg yolk, and liver (daily), with relatively little fat but rich in "food iron." On very moderate protein and caloric intakes (1,500-1,900 calories daily) most of the series showed a positive nitrogen balance and a retention of iron which corresponded closely with the rise in the haemoglobin values of the blood. They were unable to find any excess of unsaturated fatty acid either in the stools or in the blood, and consequently regard this as added proof against there being any possible relation between these acids and the increased haemolysis seen in pernicious anaemia. In general, the urine showed low figures for the urea and ammonia, but a high uric acid excretion. A plea is presented for the continued use of the older haematinic drugs, iron and arsenic. D. S. LEWIS

Blood Concentration Changes in Extensive Superficial Burns, and their Significance for Systemic Treatment. Underhill, F. P.; Carrington, G. L., *et al.* *Arch. Int. Med.*, July, 1923. Vol. 32, p. 31.

Attention is drawn to the similarity between the immediate results of war gas poisoning and of extensive burns of the body surface by heat. The victims of a theatre fire in New Haven, offered a large series for observation with interesting results.

The first feature in severe burns is a marked concentration of the blood, during which the haemoglobin may rise to 230 per cent., the average level in fifteen cases being 175 per cent. If untreated, this concentration of the blood may persist for a week following the burn with a continuance of the well known symptoms of delirium, unconsciousness, and collapse, but following active treatment these symptoms rapidly disappear. In addition to the usual paraffin dressings, the routine treatment consisted in the forcing of fluids by mouth, rectum, under the skin or by vein to the extent of from four to eight litres *per diem*. As a result of this large intake there was marked symptomatic improvement, the haemoglobin rapidly fell and remained within normal limits after the first forty-eight hours.

Careful examination of the nitrogenous constituents of the plasma failed to show the presence of any specific toxic substance which might have accounted for the symptoms usually following severe burns. Any changes could be readily explained by the extreme concentration of the blood. The authors also present conclusive evidence that the impending shock, low blood pressure, and high temperature of these early cases, is the natural response of the organism to an extreme concentration of the blood.

The communication marks another step in the advance to a rational basis for our therapeutic measures. D. S. LEWIS

Quantitative Studies with Arsphenamine.

Kolls, A. C., and Youman, J. B. *Bull. Johns Hopkins Hosp.*, June, 1923. Vol. 34, p. 181.

A quantitative method for determining the amounts of arsphenamine actually in the tissues is presented, and the authors have used this method in a study of the distribution of the drug through the body after its injection. They find that approximately three-fourths of the arsphenamine leaves the blood stream within a few minutes after its injection, but that traces may still be found in the blood twenty-four hours after treatment. The drug is stored in the liver, spleen, kidneys, lungs, cardiac and skeletal muscle, but excretion and alteration of the molecule markedly reduces the amount of the drug within three hours after the injection. The liver is a more important excretory organ for the drug than is the kidney.

In experimental animals the brain shows a much lower concentration of salvarsan than does any other tissue; while the cerebrospinal fluid in the first twenty-four hours shows such minute amounts that it cannot be estimated with accuracy; even though the method is sufficiently delicate for consistent results in dilutions of one part in five hundred thousand. D. S. LEWIS

The Importance of the Antagonism Between Potassium and Calcium for Pathology and Physiology.

Zoudek. *Klinische Wochenschrift*, Berlin, February 26th, 1923.

An ion is defined as an atom (H. Na. Cl. K) or group of atoms (OH, SO^4, No^3) electrically charged. Positively charged ions are attracted to the kathode and are, therefore, called kations (H. Na. Ca.), while negatively charged ions are anions (OH. Cl. SO^4). A molecule such as Na. Cl. is an electrolyte.

A brief description of the ionic theory will facilitate comprehension of the subject. When an electrolyte, NaCl for instance, is dissolved in water, it exists in the solution not merely in the form of the salt, but also as its constituent ions or electrons. This separation which is called dissociation is to be distinguished from chemical decomposition; no evidence of free chlorine or free sodium can be detected chemically in a solution of sodium chloride. The proof that such dissociation takes place is found in the changes of the physical properties of the solution (Wood).

The condition of cell-colloids, their power of imbibition and precipitation, is largely influenced by the ions in the fluids flowing about the cells, notably the kations potassium and calcium. Potassium is monovalent, calcium divalent. Zoudek describes experiments proving the antagonistic action of these ions. Fertilized eggs of fundulus, for example, do not develop in water containing a monovalent kation such as sodium or potassium. They also die if placed in a solution of divalent or polyvalent salt. But if placed in a solution containing monovalent and divalent or polyvalent salts, the eggs remain alive, and development proceeds. Between these salts an antagonism exists which is in harmony with their electrical charges.

An experiment with a frog's heart showed that in a monovalent kation solution such as sodium chloride action ceased with the heart in relaxed condition; that a solution of calcium was also poisonous, while in a mixture of the two the action was resumed. Every change of ion equilibrium leads to a disturbance of cell function. In the frog's heart an increase of potassium content leads to strengthening of the diastole, an increase of calcium to strengthening of systole.

In the gastro-intestinal tract increase in potassium content induces increased tone and lively contractions, increase of calcium to diminished tone and cessation of spontaneous contraction. The action on the smooth musculature of the bladder, uterus, and blood-vessels is the same in principle. Experiments have shown that the excretory power for glucose in a frog's kidney is dependent upon the relation of calcium and potassium in the fluid passed through the kidney; also the onset of a general oedema depends upon disturbance of the calcium-potassium proportion in the fluid passed through a frog's blood-vessels.

Briefly, Zoudek maintains that the cell-function of the various organs is dependent upon a certain combination in which the antagonistic action of calcium and potassium is of striking importance, and that every interference with the kation equilibrium leads directly to disturbance or at least a change, of function. But these changes parallel the changes seen in normal functional life, such as alternate relaxation and contraction of the heart and of the intestine.

The author has demonstrated that vagus stimulation has an effect similar to that of an artificial increase of potassium content; while sympathetic stimulation corresponds to calcium concentration. There is an inter-dependence between the ion equilibrium and nerve (i.e., vagus and sympathetic) function. The potassium-calcium antagonism represents absolutely the vagus sympathetic antagonism.

The functional activity of the cell or organ is bound up with alternating supremacy of electrolytes, notably potassium and calcium. Every functional change in the cell is accompanied not only by an alteration in the potassium-calcium relation, but also by the hydrogen-hydroxyl (H-OH) relation. A relative preponderance of calcium disposes the colloid electrolytes to dissociation of hydrogen, a relative potassium preponderance to dissociation of hydroxyl. Precisely how ion antagonism influences changes in cell form and metabolic changes is not clear. No doubt, changes in cell colloids and water content play a great part.

The author proceeds to apply the above principles to pathological conditions. Where an abnormal condition of the vegetative nervous system exists there is corresponding disturbances of electrolyte equilibrium. Vagotonia, for instance, is characterized by electrolytic change in the cell-membranes of certain organs in the sense of a relative potassium concentration; sympatheticotonia by a relative calcium concentration. Since the normal excitability of the vegetative nervous system is to a large extent dependent upon a normal hormone system, disturbances of internal secretion disclose themselves through disturbances of the vegetative nervous system and changes in electrolytic balance.

Instances in this connection are the diminution in calcium content in the blood in Basedow's disease, and increase in myxoedema. In tetany, in which the parathyroid glands are involved, the muscle phenomena are explained by the lack of calcium and consequent preponderance of potassium. This latter, it has been proven, leads to a local alkalosis. The author claims that a therapeutic proof of the correctness of this statement lies in the fact that the symptoms of tetany can be completely removed by the administration of acids and ammonium chloride.

Again, in cases of failures of compensation in the heart without anatomical lesion, the author holds that it is reasonable, in view of experiments with frogs' hearts in various potassium and calcium solutions, to assume a disturbance of the electrolytic relation of potassium and calcium, similarly to so-called functional disturbances of other organs.

The author holds that it is not reasonable to separate functional and organic diseases essentially from one another; and that the distinctions which we draw are merely the expression of the incompleteness of our methods, as result of which we always consider cell changes as morphological.

Since organic conditions are frequently bound up with functional conditions, it follows that in the former, electrolytic disturbances must play a part. The relations existing between the known electrolytes and the vegetative nervous system, point the way to rational therapeutics.

A. G. Morphy

Prophylactic Vaccination against Acute Tonsilitis. Bloomfield, A. L., and Felty, A. R. *Bull. Johns Hopkins Hosp.*, August, 1923. Vol. 34, p. 25.

In a previous paper, the authors have shown that the carriage of a hemolytic streptococcus in the tonsil is associated with a high grade resistance to acute tonsilitis. This resistance only persists so long as the individual remains a carrier of this particular strain of streptococcus. In the present paper, they present a further series of ninety hospital nurses, of whom thirty-three were found to harbour hemolytic streptococci, while in fifty-seven the tonsils were free from this organism. About one-third of the entire series received three injections of a vaccine made from cultures of the particular streptococcus (total dosage 200 million), following which sixteen per cent. of those inoculated had mild attacks of tonsilitis with a loss of only four duty-days, while thirty-one per cent. of the unvaccinated developed quite marked seizures with a total loss of 100 days off duty.

The authors suggest that inoculation has a definite value in protecting those susceptible to acute tonsilitis.

D. S. Lewis

News Items

GENERAL NEWS

It is a pleasure to note that at the annual dinner of the British Medical Association held in the Town Hall at Portsmouth on July 26th, Dr. A. D. Blackader, Editor of the *Journal* was one of two who replied to the toast of the guests. His remarks are quoted in the *Brit. M. J.* Supplement of Aug. 4th. Speaking unofficially he said he would like to see the Canadian Medical Association affiliated with the British Medical Association but pointed out at the same time the difficulties in Canada with its scattered population as compared with a tight little community like England, of building up a strong national association. He must leave, he said, to the Secretary of the Canadian Medical Association to give the proper answer to the invitation from England to hold a Canadian Medical Association Meeting in that country. As a private member of the Canadian Association he desired to say that the proposed meeting would be received with the most sympathetic consideration. He would like to see at any rate, an exchange of delegates at the respective meetings of the two Associations. "In Canada," he remarked, "they looked to the Imperial Association with a great deal of respect and filial feeling, and any proposals for closer—even though sentimental—union would have their very careful consideration."

NOVA SCOTIA

A fine new hospital building is approaching completion at New Waterford.

The Annual Meeting of the Provincial Medical Board of Nova Scotia was held on the 18th of July, when much business of importance was transacted. The Board now requires of all candidates for its license evidence of preliminary education at least equivalent to the complete senior matriculation of a chartered Canadian University, followed by five years of professional study. The matter of requiring six years of professional study is under consideration. Drs. J. G. MacDougall and W. H. Hattie were re-elected President and Registrar respectively.

A meeting of the Lunenburg-Queens Branch of the Medical Society of Nova Scotia was held at Bridgewater on the 7th of August. There was a good attendance, and the programme proved most interesting and instructive. Dr. J. G. MacDougall, of Halifax, addressed the Branch on "Every day kidney and bladder conditions." The subject was treated exhaustively from the standpoint of etiology, pathology, and treatment, emphasis being laid on the prevention of extension of infection. A valuable discussion followed. Dr. H. A. Chisholm, of the Provincial Department of Health, spoke on the public health aspect of venereal diseases, and mentioned the desire of the department to re-open a venereal disease clinic in Lunenburg County. Dr. S. L. Walker, Associate Secretary of the provincial society, discussed the ethics of organization, pointing out that physicians should be the leaders in public health movements if such movements are to be carried on in the best interests of all concerned. New officers were elected, Dr. J. S. Chisholm being chosen as president.

At a well attended meeting of the Cumberland County Branch of the Medical Society of Nova Scotia held at Pugwash on the 13th of August, Dr. John Stewart, of Halifax, gave a very fine address on the present status of the cancer problem. The address was discussed by Doctors Avard, Bliss, Millar, and others. Dr. Walker was present and addressed a public health meeting in the evening at which the President of the Society, Dr. D. MacKintosh, presided. The society referred two matters to the Executive of the Provincial Society. One had to do with an inquiry as to the cause of the inadequate action taken by the Attorney-General's Department regarding a death said to have been caused by a cancer quack's treatment. The other brought up the question of the provincial society becoming responsible for the collection of local society fees.

A stated meeting of the Colchester-Hants Branch of the Medical Society of Nova Scotia was held in the drawing-room of the Nurses' Home at the Payzant Memorial Hospital, Windsor, on the 28th of August. Dr. A. R. Reid, the Vice-President, presided. Apart from routine business, the principal items on the programme were papers by Dr. W. H. Hattie, of Halifax, on "The Physician," and Dr. S. L. Walker, of Halifax, on "Ethical Reflexes." Dr. Hattie traced briefly the development of medical teaching, referred to present standards of medical schools and licensing bodies, and stated that nothing had been more effective in reducing popular resort to quackery than the more efficient preparation for medical practice which has become so general within recent years—although much credit must also be given to the interest in the care of health which has been aroused by sane publicity of public health authorities. The public expect, and are beginning to demand, competence, in those who practice the healing art, and it therefore behooves physicians to utilize every available means of keeping fully abreast of the advances in medical knowledge. Dr. Walker discussed the relationship of the physician to his colleagues and the public, and drew a picturesque comparison between ethical practices and reflex responses. He referred to the prevalence of more or less pronounced degrees of physical disability which are not receiving attention, and said that the activities of public health workers in revealing such conditions were opening up vast and at present untilled fields for medical practice. If physicians were to give more support to public health agencies, they would receive ample reward for what might appear to be merely altruistic interest.

Dr. H. A. Chisholm, of the provincial department of health, brought up the matter of admission of necessitous persons to the Nova Scotia Sanatorium. Patients are admitted to the Victoria General Hospital, and to the Hospital for the Insane, both Government Institutions, upon the certificates of physicians, and should they be unable to pay for maintenance therein, collection of a proportion of the cost of maintenance is made under statutory provision, from the municipalities in which they have their settlements. In the case of a person suffering from tuberculosis, however, admission to the Sanatorium at the expense of the municipality is possible only after consent of the municipal authorities has been obtained. This consent is frequently delayed and sometimes withheld. The Branch decided to petition the provincial government to secure the legislation necessary to have the sanatorium placed on the same basis, in respect of admission of necessitous patients, as the other government institutions.

The presentation of case reports by Dr. Keddy, of Windsor, and Dr. Patton, of Truro, was postponed. After adjournment, the members were hospitably entertained and feasted by Miss Martin, the Superintendent of the hospital.

QUEBEC

Dr. Edward W. Archibald has returned to Montreal after spending a few weeks in England and France.

Sir Henry Gray of Aberdeen, recently appointed Surgeon-in chief of the Royal Victoria Hospital, has arrived to take up his duties. He was the guest of honour the other day at a dinner given by the Kiwanis Club of Montreal. Dr. George E. Armstrong spoke of the excellent work Sir Henry Gray had already done in the practice of civil and military Surgery and wished him every success in Montreal. The Rev. Father McShane and the Rev. Dr. Frank Charters on behalf of the clergy, Alderman Gareau on behalf of the City of Montreal, Colonel Alexander a representative of the military district, and Mr. Henry Elliott, K.C. on behalf of the legal profession, welcomed Sir Henry Gray to Montreal. In reply Sir Henry Gray thanked the previous speakers and spoke of the responsibilities and ideals of the surgeon.

ONTARIO

The Northumberland and Durham County Medical Society met at Cobourg on July 26th, Dr. S. L. Alexander of Toronto spoke on "Headache of Nasal Origin".

A meeting of the Peel County Medical Society was held in Brampton on August 2nd, Dr. W. L. Robinson of Toronto spoke on "Classification, Pathology, Diagnosis and Treatment of Diseases of the Thyroid". Dr. R. D. Rudolf of Toronto spoke on "Cardiac Stimulants".

The Ontario Medical Society met at Beaverton on August 2nd, Dr. H. B. Anderson of Toronto addressed the meeting.

The Victoria Medical Society met at Lindsay on August 3rd, Dr. H. S. Hutchinson spoke on "The Modern Treatment of Nephritis."

A meeting of the Hastings County Medical Society was held at Marmora on August 8th, Dr. Roscoe Graham of Toronto spoke on "The Surgical Aspect of the Chronic Dyspeptic."

The Peel County Medical Society met at Brampton on August 9th. The address was given by Dr. G. S. Young of Toronto, the subject being "A Discussion of the Value of the Physical Signs in the Examination of a Patient."

The Northumberland and Durham Medical Society held a meeting at Newcastle on August 23rd. Dr. W. T. Connell of Kingston spoke on "Arteriosclerosis and Hypertension."

The Norfolk County Medical Society met at Port Dover on August 28th. Dr. F. W. Hughes of London spoke on "The Relation of Literature to a Medical Career."

The opening meeting of the Hamilton and Wentworth County Medical Society, took place on Wednesday September 5th. After the business meeting the Association was addressed by Dr. Norman B. Gwyn of Toronto on "Post-operative Pulmonary Complications."

The Provincial Board of Health has issued an excellent pamphlet on the use of Insulin, this pamphlet appearing as a booklet of information respecting the free distribution of Insulin is issued by Dr. John W. S. McCullough, Chief Officer of Health, and is addressed to the Honorable Forbes Godfrey, M.D., Minister of Public Health and Labour. It only remains to be said that the chief Officer of Health, and the Minister of Public Health and Labour are to be warmly congratulated for putting the problem of treatment of diabetes so clearly before the eyes of the general practitioner. It is a pamphlet, the value of which would be difficult to over estimate and one hopes the public at large will be properly informed through the medium of the daily press just how important these activities of their public servants appear in the eyes of the medical world.

Dr. Banting, Professor of Research Medicine at the Toronto University Medical faculty visited Great Britain this summer addressing the International Surgical Congress of London, the British Medical Association meeting in Portsmouth, and the International Physiological Society Meeting in Edinburgh, also giving informal talks to the students at Guy's and other medical schools.

Dr. Edward Gallie of Toronto has been appointed Hunterian professor and lecturer at the Royal College of Surgeons in London in April 1924. The subject of the lectures will be "Living Sutures."

District No. 3 of the Ontario Medical Association comprising the Counties of Bruce, Grey, and Dufferin, held a very interesting meeting in Owen Sound on Monday, September 10th, under the auspices of the Grey County Medical Society. Dr. T. H. Middlebro, Counsellor of the District presided. During the afternoon, the following papers were given:—"Some Sidelights on So-called indigestion," by John A. Macgregor, London; "Some Serious Complications of Otitis Media and their Diagnosis," by Dr. J. K. M. Dickie, Ottawa; "The Right Iliac Fossa—A plea for care in diagnosis and treatment," by Dr. F. N. G. Starr, Toronto. At 6.30 p.m., dinner was served at the Y.M.C.A., and was immediately followed by addresses from Dr. J. F. Argue, Ottawa, President of the Ontario Medical Association, Dr. T. C. Routley, Secretary of the Ontario Medical Association, and Dr. A. A. Fletcher of Toronto, who spoke on "Insulin and Diabetes." From the point of view of attendance (there being about sixty present), quality of programme and interesting discussions, the meeting was one of the best yet held by the District.

The dates for the forty-fourth Annual Meeting of the Ontario Medical Association have been fixed for June 17th, 18th, 19th and 20th, 1924, when a joint meeting with the Canadian Medical Association will be held in Ottawa under the auspices of the Ottawa Medico-Chirurgical Society.

A meeting of the Renfrew County Medical Society was held in Cobden on September 12th when addresses were given by Dr. C. S. Wright, Toronto, on "Personal Experiences in the Investigations of Chronic Arthritis," and Dr. E. J. Trow, Toronto, on "The Diagnosis and Treatment of the Common Skin Affections."

A meeting of the Northumberland and Durham Medical Society was held at Campbellford on September 13th, when a paper was given by Dr. Geo. S. Strathy on "the Differential Diagnosis of Pain in the Back."

The Annual Meeting of District No. 10 in the Ontario Medical Association, comprising the districts Kenora, Rainy River, Thunder Bay, and Patricia, was held in Fort William and Port Arthur on Friday, September 14th. The morning session was devoted to clinics and ward rounds at McKellar Hospital. Luncheon was served at the Kaministiquia Club, followed immediately by excellent addresses from Dr. A. A. Fletcher of Toronto on "Insulin and Diabetes," and Dr. F. N. G. Starr, Toronto, on "The Right iliac Fossa—A plea for care in diagnosis and treatment." The evening session was held at Port Arthur commencing with a banquet at the Shuniah Club, followed by addresses from Dr. J. K. M. Dickie, Ottawa, on "Some Serious Complications of Otitis Media and their Diagnosis"; Dr. J. F. Argue, President of the Ontario Medical Association; and Dr. T. C. Routley, Secretary of the Ontario Medical Association. One of the interesting features of the meeting was the large attendance of physicians from distant parts of the District. The day was considered to be one of the most interesting and enjoyable of the several annual District Meetings which have been held.

The members of District No. 9 of the Ontario Medical Association, comprising the counties of Algoma, Temiskaming, Sudbury, Nipissing, Parry Sound, and Muskoka, were the guests of the Sault Ste. Marie Medical Society on Wednesday, September 12th, when the following programme was presented:—Address by Dr. J. F. Argue, President of the Ontario Medical Association; "The Right Iliac Fossa—A plea for care in diagnosis and treatment," by Dr. F. N. G. Starr, Toronto; "Some Side-lights on So-called Indigestion, by Dr. John Macgregor, London; "Insulin and Diabetes," by Dr. A. A. Fletcher, Toronto; "Some Serious Complications of Otitis Media and their Diagnosis," by Dr. J. K. M. Dickie, Ottawa; "Resumé of the Past Year," by Dr. T. C. Routley, Secretary of the Ontario Medical Association, Toronto. One of the most interesting features of the meeting was the dinner at the Country Club to which ladies were invited. The Sault Ste. Marie Society are to be congratulated on the excellent arrangements which were provided to carry out one of the most delightful meetings in the history of the District.

On September 13th, the Simcoe County Medical Society met at Allandale, when an address was given by Dr. Geo. S. Young, Toronto, on "The Diagnosis and Treatment of Goitre."

Dr. R. W. Mann of Toronto addressed a meeting of the Hastings County Medical Society in Stirling on Sept. 12th, on "The Treatment of Diabetes Mellitus."

The Peterborough Medical Society met on September 20th, an address being given by Dr. K .C. McIlwraith, Toronto, on "Modern Views of the Conduct of Labour."

On September 20th, the New York County Medical Society met at Stouffville when an address was given by Dr. W. G. Cosbie on "Modern Views on the Toxaemias of Pregnancy."

On September 7th, a meeting of the Ontario Medical Society was held at Oshawa when an address was given by Dr. W. T. Connell on "Arteriosclerosis and Hypertension."

Obituary

DR. GORDON BELL

To the medical men of Manitoba, indeed of the whole West, and to many in the East the sudden death of Dr. Gordon Bell, of Winnipeg, on August 8th, came with all the shock of a personal bereavement. His whole illness, a profound infection, likely streptococcal, lasted scarcely a week. As the news spread it was remarked by one and another of his old associates that no one could have left so big a gap in medical work in the Canadian West, and none could be more sincerely mourned either for what he was or for what he did.

Born at Pembroke in 1863, he received his general education at Pembroke and the University of Toronto, and his medical education at the University of Manitoba. He was Superintendent from 1890 to 1893 of the Mental Diseases Hospital at Brandon; for a time thereafter was associated in eye, ear, nose, and throat work with Dr. J. W. Good, and gave this up in 1896 to become provincial bacteriologist and pathologist of Manitoba. He was Professor of Bacteriology and Hygiene of the University of Manitoba and Chairman of the Provincial Board of Health. He was really the father of the Manitoba Sanatorium at Ninette and a member of the Board and executive up to the time of his death.

The peculiar place he had in his profession and in the hearts of his associates may be gathered from some paragraphs of a minute passed by the Manitoba Medical Association:

"With the death of Doctor Gordon Bell there has passed from among the medical men of Manitoba the one who by the vote of all would have been named as their most eager enquirer after truth, their wisest counsellor and their kindliest man.

"To a clear, keen mind Doctor Bell added a most discriminating and retentive memory and a wonderful instinct for getting the crux of a question. From a very wide area the problems of many practices were brought to him. 'What Gordon Bell thought about it,' was the final word in thousands of difficulties. His instant diagnosis or prophetic prognosis came perhaps from a recollection of a similar condition a quarter century ago. But beyond and above his ripe experience, firm grasp of fundamentals, and sound judgment, there was a very rare insight that was his own peculiar possession. The very cream of all his reading and experience, and indeed of the medical experience of a good part of the Canadian West for thirty years back, was available and most freely available in him to the doctors and to the people of the province.

"Such informal consultations and discussions were a large part of his every day's work. His door was always on the latch. His formal lectures were a small part only of the grand total of his teaching. His formal duties were a small part only of his wide work. He was called to a high vocation and gave to it the whole great wealth of his being.

"What he has been to Medical Education and to better standards of practice throughout Western Canada who can estimate? He was in himself university and university extension. What it has meant all these years to have within the Medical School a teacher of such equipment and such spirit, approachable without formality by any student or physician, or any stranger at any time, giving each freely of his best, and with the kindly hospitality of a gracious host superadded, may be the better estimated now—Alas!—that his chair is empty.

"There could be no better friend or more delightful companion. He was a part of all that he had met. Nothing of interest to mankind was alien to him. A lover of nature in its every phase, a conserver of wild life, giving his life to the bettering of health, always the friend of the weak, always angry at injustice, himself always just and always kind, he was a man of the very finest mould as he was a physician of very unusual capacity and attainments."

It is well worth appending also the graceful and true editorial tribute of the *Manitoba Free Press*. A man and physician of Dr. Bell's fineness could scarcely fail of appreciation in the community at large:

"It might be truly said of Dr. Gordon Bell, whose unexpected death yesterday has put this city in mourning, that he was the most beloved physician of Winnipeg. Indeed, there is no need to bound the expression by any professional limitations. It would be entirely just to say that Winnipeg has lost its finest citizen, judging by the qualities that count: beauty of character, elevation of mind, charm of manner, kindliness of disposition and devotion to the public good.

"The beauty and worth of such a life as that of Dr. Bell's is not truly felt until it is lost. Dr. Bell had been for so long a time one of the centres of thought and action in our community that he and his services were taken for granted; it is only by the void that his going leaves that we shall begin to understand how much that quiet, unostentatious life, that character of perfect selflessness and utter devotion, that high talent dedicated to the public service, meant to this city.

"The best answer to the materialist, the cynic, the money-grubber, the scorner of public duty, the disbeliever in all motives save those that serve self-interest, are lives such as that lived by Dr. Bell. Not only are they answers to the doctrines of earth, but it is examples such as his which purify our civic life by lighting the fires which show the paths of duty and service to the generations.

"A great and—what is better far—a good man has passed on, leaving the community a memory which it will long cherish and an example that will not lack emulation by young and generous souls following in his footsteps."

JOHN CHIELE, C.B., M.D., LL.D., D.Sc., F.R.C.S. (Edin.)

Emeritus Professor of Surgery, University of Edinburgh.

In all parts of Canada the influence of the Edinburgh School has permeated the ranks of medicine. Many of our practitioners are graduates of that University; many more have pursued post-graduate studies there; and because some of our own medical schools (notably McGill) have been founded upon, and for years have closely followed, the system of medical education as developed in Edinburgh University, the majority of us owe much to that venerable institution and to the great minds who directed it. It is, then, with an uncommon interest and sorrow that we record the death, on May 29th last, of John Chiene, C.B., Emeritus Professor of Surgery.

Born in Edinburgh in 1843, he had attained the mature age of eighty years. He maintained excellent health, was ill but a few hours, and his end was peaceful. He was a man of parts and a vigorous student. In his preliminary education he excelled in mathematics winning the Ferguson and Mitchell Medals at the ages of sixteen and seventeen, respectively. He was also active in athletics and played on the school teams in football and cricket. His intimate and lasting interest in rugby was further evinced by his being elected the first President of the Scottish Football Union in 1872 and again holding that office in 1877. He graduated with honours from the Edinburgh School of Medicine in 1865. He was house-surgeon to Mr. Syme then Professor of Clinical Surgery in the Royal Infirmary. Later, 1869-78, he was associated in clinical study with Joseph Lister who succeeded Syme. During this period he was also teaching anatomy, being a demonstrator in John Goodsir's class. In 1870, Chiene began to lecture in the Extra-Mural School upon operative and systematic surgery, and the class grew rapidly from 13 to 155 students. In 1882, at the age of thirty-nine, he was elected to the Chair of Surgery in the University, a post he held until 1909.

His early success with students was now shown to be due to special personal gifts as a teacher, combined with great simplicity and earnestness, a faculty for clear exposition, and a racy and genial humour. In the wards where his clinical teaching was carried out, sympathy and kindliness of heart were characteristics that commended him both to students and patients. Along with this, however, he had a capacity for direct speaking which gained for him among the students the sobriquet of "Honest John." He was dominated by his feeling of responsibility as a teacher. His lectures were directed towards inculcating the principles of surgery with relatively little regard for changing details of operations. Another matter which receives, perhaps, too little consideration in present-day medical schools, is that he taught rather with the object of rendering his students efficient for general practice than with the view that they should become specialists in surgery. In clinical teaching, Chiene was fond of drawing the attention of his dressers to two sketches hung in the side room of his ward for their benefit, one illustrating a mother bird feeding a nestful of gaping youngsters—the wrong kind of teaching—the other representing a new-fledged chick picking up grains of corn for itself—the correct method of gaining knowledge.

He established a laboratory of bacteriology and surgical pathology in connection with the Chair of Surgery, this being the first of its kind in the United Kingdom, and although not himself a laboratory worker, he spared neither time nor money to encourage research by his junior assistants. His publications were not many. A collection of *Lectures on Surgical Anatomy*, with thirty-one plates, was published in 1878, while he was still an extra-mural lecturer, and a small fasciculus entitled *Principles of Surgery* was issued in 1882, the year in which he was elected to the Chair of Surgery. He made also occasional contributions to periodical medical literature. Those interested in Edinburgh anecdotes and in golf, cannot but be charmed with his *Looking Back, 1907-1860.*

In 1900, when local patriotism was equipping hospitals in various parts of the country to aid the forces in South Africa, he went out as the senior surgeon of an Edinburgh hospital, becoming, soon after arrival in South Africa, Consulting Surgeon to the South African Field Force.

An indication of the affectionate regard entertained for him was afforded by a dinner given in his honour in 1911, by the survivors of his numerous house-surgeons. Letters of appreciation were received from all these, save one in a distant part of the world, and out of a total of sixty-eight, nearly forty were present in Edinburgh to celebrate the occasion.

The funeral took place on Friday, June 1st, at the Dean Cemetery, Edinburgh, and was attended by a large gathering representative of the medical profession and general public.

Dr. C. A. Barnaby, a much respected member of the profession, died at Halifax on the 15th of August. Dr. Barnaby had practiced in several parts of Nova Scotia since 1881, but removed to Halifax some years ago, where, on account of indifferent health, he was obliged to live quietly, and to undertake but little professional work. Some months ago he found it necessary to forego all practice, but was able to go about until within a few days of his death. He was ever ready to do a good turn and enjoyed the esteem of all who came in contact with him.

Dr. J. P. Vrooman, M.P.P.—died at the General Hospital in Kingston on August 20th, 64 years of age. A graduate in medicine of the University of Toronto in 1883, Dr. Vrooman practiced in Yarker and later moved to Napanee where he has since practised. Dr. Vrooman was the Liberal member for Lennox having been elected member of the Ontario Legislation in June.

Dr. James G. Scott of Seaforth, died on August 25th in his 81st year, as the result of an accident. A graduate of the College of Physicians of Ontario in 1871, Dr. Scott had spent the most of his life in Seaforth, being one of the early settlers.

Dr. I. C. Sharp, the well known physician of Montreal passed away at Ottawa recently. For more than a quarter of a century he practiced in Point St. Charles, and was considered the doyen of local physicians. Dr. Sharp was the son of the late I. N. and Mrs. Sharpe, and was born at Studholm, in King's County, N.B. on November 25, 1856. He graduated in medicine from McGill University and was for some time house surgeon in the Montreal General Hospital. In 1885 he began a successful practice at Marysville, N.B. then the industrial centre of the late Alexander Gibson. Removing to Montreal in 1898, he resided at 545 Wellington Street for the past twenty-five years, where he built up an extensive practice, and established a wide reputation as a practitioner and consultant. He lectured in Bishop's College at the time of its amalgamation with McGill on 1905. He was buried in Fredericton, N.B.. He leaves a wife, one brother, and one sister.

Contribution to the Pathologic Physiology of Botulism.—Charles W. Edmunds and Perrin H. Long, Ann Arbor, Mich., summarize their findings as follows: There is in botulism a partial paralysis of the endings of the motor nerves going to the voluntary muscles. In some cases this curare-like action is almost complete, as in the case of the nerves supplying the neck muscles of chickens. This action will explain all of the characteristic symptoms of botulism which are motor in origin. The involvement of the phrenic nerves explains the early paralysis of the diaphragm. The effect of the toxin on the nerves to the respiratory muscles is responsible for the gradually increasing weakness of the respiration, and for its final failure, which is responsible for death under this form of poisoning. The involuntary muscle of the esophagus, stomach and intestine acts in a normal manner to epinephrin, physostigmin and other peripherally acting drugs, indicating that the symptoms, such as difficulty in swallowing, and constipation, are probably not due to an action of the toxin on structures located in the gastro-intestinal wall. The vagus nerve is also affected, as it largely loses its control over the heart rate, thus probably accounting for the acceleration of the heart described in certain of the cases of human botulism. The toxin is apparently not excreted in the urine, but may be demonstrated in the blood long after it has been injected. On the basis of their experimental work, it is recommended by the authors that in cases of human botulism, when the respiration shows signs of failure, artificial respiration be instituted—if necessary, by means of bellows and a tracheal cannula. In dogs this procedure has given promise of success. The careful administration of physostigmin is also recommended.—*Jour. A. M. A.*, Aug. 18, 1923.

Isolation of Bacterium Pneumosintes from Influenza Patients.—From the nasopharyngeal secretions of six patients in the early hours of typical, uncomplicated epidemic influenza during the epidemic of January and February. 1923, Peter K. Olitsky and James E. McCartney, New York, observed in five instances an active agent, pathogenic for rabbits. On culture of the filtered secretions and of the lungs of rabbits inoculated intratracheally with these materials, four new strains of *Bacterium pneumosintes* have been isolated, one directly from the secretions and three from the rabbits' lungs. All the strains have been identified as agreeing with those of the 1918-1919, 1920 and 1922 strains in morphology, cultural properties and serologic reactions. Agglutinins against *Bacterium pneumosintes* were demonstrated in six of ten patients who have recovered from an influenzal attack.—*Jour. A. M. A.*, Sept. 1, 1923.

Book Reviews

"Orthopedic Surgery". By Sir Robert Jones, K.B.E., C.B., Ch.M. Liverpool, F.R.C.S., England, Ireland and Edinburgh, F.A.C.S., (U.S.A.), and Robert W. Lovett, M.D., F.A.C.S., John B. Buckminster Brown, Professor of Orthopedic Surgery in Harvard University. Large Octavo. Pages 669. Illustrated with 712 Engravings. Price $9.00. William Wood and Compnay, New York, 1923.

From the names of the illustrious authors, the size of the volume, and the number of illustrations, one would naturally be led to anticipate a work containing the last word on this subject, so far as our present knowldge is concerned, and in most respects the reader will not be disappointed.

It is pointed out in the preface that the term "orthopedic surgery has ill-defined boundaries." While originally intended to cover that branch of surgery dealing with the deformities of children, it has gradually been extended to include deformities in general, but of recent years, and perhaps more particularly since the war, it has been again greatly extended so that the present volume "includes subjects which group themselves under six headings, viz:—(1) Joints and their affections; (2) Bones and their affections; (3) Disturbances of the neuro-muscular mechanism; (4) Congenital deformities; (5) Static and other acquired deformities; (6) The principles and details of apparatus."

The various chapters dealing with traumatic affections of joints, tuberculosis of joints, developmental diseases of bone, spastic paralysis, lesions of the lower neuron (spinal and motor centres), muscle training, congenital deformities, torticollis, congenital dislocation of the hip and other joints, club foot, lateral curvature of the spine, and the principles of apparatus are all remarkably complete.

It is to be regretted that the sections dealing with tumours of bone, and with malunited fractures are not in keeping with the general excellence of the work, and as it was obviously not the intention to deal with recent fractures the reference to the proper method of reduction of Colles' fracture might better have been eliminated, since "a firm grip with a slight traction and twist of the wrist completely reduces the deformity" can hardly be said to convey much accurate instruction.

While in general the illustrations are excellent, many of the reproductions of roentgenograms are by no means clear, and some of the illustrations depicting surgical procedures completely lose their value through too much "drapery." E. R. S.

A Text-Book of the Surgical Dyspepsias. By. A. J. Walton, M.S., M.B., B.Sc. (Lond.), F.R.C.S., (Eng.) Surgeon London Hospital, Late Hunterian Professor Royal College of Surgeons. 728 pages, illustrated. Edward Arnold & Co., London, 1923. Price 42s net.

The author has succeeded in producing a well written volume dealing with the dyspepsias, which may be classed as surgical, arising from pathological conditions of the stomach and duodenum, the liver and bile passages, the pancreas, the appendix, and general visceroptosis. The conclusions as to whether medical or surgical treatment is indicated are based on sound principles, and the various surgical procedures advised are such as will commend themselves to advanced surgical opinion.

While the work does not pretend to cover all the details of operative abdominal surgery, the various operations which have appealed to the author as being most useful are described at some length, and the merits and otherwise of different types of operations are discussed. The illustrations are somewhat diagrammatic, but in general serve their purpose excellently. Illustrative cases of some of the rarer conditions are described at length. The book will well repay careful reading, and should create a well merited demand owing to the sane and safe, though not too conservative, nature of the views expressed. E. R. S.

The Standard Methods of Milk Analysis of the American Public Health Association and the Association of Official Agricultural Chemists. Fourth edition. Published by the American Public Health Association.

The laboratory methods outlined in this book are accepted as standard by health departments and others engaged in the analysis of milk throughout the North American continent. The text is kept up-to-date by frequent revision. Previous editions have contained only bacteriological methods and the fourth edition is especially welcome because it contains for the first time methods for both chemical and bacteriological analysis of milk. The bacteriological methods are essentially the same in the fourth as in the third edition, only a few minor changes being noted.

The methylene blue reduction test is included for the first time as a provisional method and may prove of value in the rapid approximation of the quality of milk, and is a test which can be made without trained laboratory men or extensive laboratory apparatus. Slight changes are noted on page 14 in the directions for estimating the plate count from the microscopic count. The stringency of the estimation in the fourth revision is increased over the previous edition in the ratio of 4 to 5. Also it is now estimated that the official plate count normally averages 1/4 of the total number of individual bacteria present, which figure appeared as 1/5 in the third edition.

The addition of methods for the chemical analysis of milk makes the fourth edition of *Standard Methods* the most valuable yet published. A. J. S.

Text-Book of Ophthalmology. Fuchs. 7th English edition. 1,080 pages, 475 illustrations. J. B. Lippincott Co., Philadelphia, London and Montreal. Price $9.00.

The average life-time of man does not measure the years that "Fuchs" has stood as a guide for students of ophthalmology in nearly every land. Now comes this seventh edition in English, measuring up well to the standard set by its predecessors.

Some changes in arrangement of the subjects discussed have been made; these are of minor importance, though they make for greater convenience in a search. The chief point is that in the re-writing of so much of the text, full coznizance has been taken of all the recent investigations in ophthalmology, so that one may depend upon finding those advances discussed, which are by experience proven worthy. Indeed the new edition will keep its place as the outstanding authority in this specialty.

There is no division of the old book which has not been carefully gone over, and revisions made where the editor deemed necessary. Especially is this so in the chapter on motor anomalies, in which Dr. Duane is so personally interested. Also the chapter on the surgery of the eye-region has been revised and enlarged, so that in every way the volume deserves its title.

The attempt to keep the text as originally set down by Fuchs is very creditable to the editor. Altogether one can hardly conceive how a more satisfactory compilation of all that is trustworthy in this branch of medicine could be made. The book-making is of the very best; the paper and printing are perfect, so that reading is very easy. The addition of new material to the successive editions is making the volume a heavy one, and some day we expect to see our old and tried friend appearing in two volumes.

F. C. T.

Essentials of Surgery. A textbook of Surgery for Student and Graduate Nurses and for those Interested In the Care of the Sick. By Archibald Leete MacDonald, M.D., The Johns Hopkins University. Formerly in charge of the Department of Anatomy, University of North Dakota. Small 8vo, 288 pages with 49 illustrations, Second Edition, Revised. J. B. Lippincott Company, Philadelphia, London and Montreal. Price $3.00.

This small volume offers a very fair summary of surgical principles including a brief reference to gynecological conditions Each section has a list of suggested demonstrations which should be of value to instructresses in emphasizing important points, and in addition there is a fairly complete glossary.

It is to be regretted that the author has not adhered to the usual division of the abdomen into four quadrants, but has introduced a diagram illustrating nine divisions. The term "lumbar region of the abdomen" is neither sound surgically, nor anatomically.

E. R. S.

"**Mistakes and Accidents of Surgery.**" By Harold Burrows, C.B.E., M.B., B.S. (Lond.), F.R.C.S., Assistant Surgeon, The Royal Portsmouth Hospital. Demy 8vo., pages VIII—470. Price 10s-6d net. Bailliere, Tindall & Cox, Covent Garden, London.

This is at the same time one of the most readable and instructive books which has come to the reviewer's desk for a long time, and the author is to be congratulated on the result of his labours.

The various parts of the body are considered in order, with extended reference to the various mistakes and accidents which may, and do, occur in the surgery thereof. The work is eminently practical, being based, as it is, on those errors which have occurred either in the author's own experience, or of which he has personal knowledge.

It is very easy for the reader in the calm and quiet of his own library to reflect that many of the accidents here recorded could not possibly occur in his own work, and to experience a sense of amusement at what appear to be the evident short-comings of others, but the fact remains that these mistakes and accidents have taken place in the hands of competent men, and it would therefore appear that there is no surgeon who can fail to be materially benefitted by being forewarned as to the disasters which may take place in his daily work.

E. R. S.

"**The Transactions of the American Surgical Association.**" Volume the Fortieth. Edited by John H. Jopson, M. D., Recorder of the Association. Pages 675, illustrated. For sale by William J. Dornan, Philadelphia, 1922.

For some years now this volume has been described as giving a most admirable bird's-eye view of almost all that is best in American surgery during the preceding year, and while many of the articles have appeared elsewhere, it is of distinct value to have them collected between the covers of one volume.

The present volume includes the papers presented at the annual meeting of the Association in May, 1922. The Presidential Address by John M. T. Finney of Baltimore on "The Opportunities and Responsibilities of the Surgeon" is a masterly presentation of the subject. The following 150 pages are occupied with discussions of various aspects of the cancer problem by some ten surgeons of continental reputation. Nine articles on surgical lesions of the stomach and duodenum occupy some seventy pages, while thyroid surgery is referred to in only two articles, thus contrasting with the large space devoted to this subject in the previous volume.

Of special interest to the readers of the *Journal* will be the articles on "The Secondary Manifestations of Malignant Disease" by Alexander Primrose, C.B., M.D., C.M., "Experience in Surgical Treatment of Unilateral Pulmonary Tuberculosis" by Edward Archibald, M.D., and "Cecal Atony and Mobile Cecum" by F. N. G. Starr, M.B. (Tor.) and Roscoe R. Graham, M.B. (Tor.)

An article of outstanding interest to all surgeons is that on "The Limitations of the Ochsner Treatment in Certain Cases of Suppurative Peritonitis" by John H. Jopson, M.D., and Damon B. Pfeiffer, M.D.

E. R. S.

Treatment of the Neuroses. By Ernest Jones, M.D., M.R.C.P. 233 pages, price 12s-6d. Published by Bailliere, Tindall and Cox, London, 1920

After reviewing the last book by Ross, one cannot but notice the different viewpoints of the two writers, for while Ross sees most of his cases as neurasthenias, with a few hysteria and compulsion neuroses added, Jones on the other hand, is imbued with the hysteria behind his cases and devotes the greater part of his book to this subject.

The wonderful power that Ernest Jones has over the English vocabulary makes his book difficult reading, and while he has slightly curbed his Freudian persuasions, yet he is so strongly influenced by the main laws of that psychological school, that one feels he is striving for a lost cause.

The book is of interest to those who enjoy reading his clever presentations, but is not of the same value to the practitioner as is the accompanying volume of Ross.

G. W. H.

The Clinical Examination of the Nervous System. By G. H. Monrad-Krohn, M.D., M.R.C.P. Second Edition. 148 pages, 33 illustrations and 4 plates. Price 6s net. Published by H. K. Lewis & Co. Ltd. London, 1923.

This short concise manual appears in its second edition. It is slightly improved by several plates and by the addition of a little more subject matter. It is the best short manual on this subject to be had, and is suitable for students and physicians who require an easy aid to examination.

G. W. H.

The Common Neuroses, Their Treatment and Psychotherapy. By T. A. Ross, M.D., F.R.C.P. (Edin.) 256 pages. Price 12s-6d net Published by Edward Arnold & Co., London, 1923.

Considering the great number of books on functional nervous disease which have appeared the last few years, of which, one must sadly add, few are in the least suitable for the general practitioner, as they are filled with terms that the writers themselves can hardly explain, it is with a sense of pleasure that one reads this new volume. Influenced by that great mas-

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ter mind of neurology, Déjerine, Ross has produced a book that is useful and interesting. True he is wedded to the term neurasthenia, which is almost enough to kill any interest in the medical world, but on the other hand, he has given a new outlook to treatment in the large space that he has allotted to it in the book. This book is practical, and is well worth reading. G. W. H.

Books Received

Practical Dietetics—Alida Frances Pattee, 687 pages, fourteenth edition. Price $2.60. Publisher, A. F. Pattee, 134 South First Ave., Mount Vernon, New York.

Collected Papers of the Mayo Clinic—By Mrs. M. H. Mellish. Vol. XIV. 1394 pages, 488 illustrations. Price $13.00 net. Publishers, W. B. Saunders Company, Philadelphia and London. Agents: The J. F. Hartz Co. Limited, Toronto.

The Mortality Experience of Industrial Policyholders—A Contribution to the Public Health Movement in America by a number of Insurance Companies. 150 pages.

The Effects of Radium Upon Living Tissues—By Sidney Forsdike, M.D., B.S. 72 pages, 42 illustrations. Price 5s. net. Publishers, H. K. Lewis & Co. Ltd., London.

A Clinical Guide to Bedside Examination—By Dr. H. Elias. 135 pages. Publishers, Rebman Company, New York.

International Clinics—Vol. II., by Henry W. Cattell. 304 pages, illustrated. Thirty-third series, 1923. Publishers, J. B. Lippincott Company, Philadelphia, London & Montreal.

Colonic and Duodenal Lavage—With a suggested Improvement in the Plombieres Treatment, by Capt. J. T. Ainslie Walker, R.A.M.C. 12 pages and 2 illustrations. Price 1s. net. Publishers, H. K. Lewis and Co. Ltd., London.

Physiotherapy Technic—by C. M. Sampson. 443 pages, 85 illustrations. Price $6.50. Publishers, C. V. Mosby Company, St. Louis, U. S. A.

Hygiene and Public Health—by Louis C. Parkes, M.D., D.P.H., and H. R. Kenwood, C.M.G., M.B., F.R.S. Edin., D.P.H. Lond. Seventh edition. 783 pages, 90 illustrations. Price 20s. net. Publishers, H. K. Lewis & Co., Ltd., London.

The Ophthalmic Year-Book—by Edward Jackson and William H. Crisp. Vol. XIX, 1923. 390 pages. Publishers, The Ophthalmic Publishing Company, Chicago, Ill.

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UTERINE BLEEDING AND CAUSES OF UTERINE HAEMORRHAGE*

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IN practically all countries where civilization exists uterine bleeding occurs as a physiological process, and at fairly regular intervals, throughout a period of about three decades in the life of the female of the human species. Though instances of precocious bleeding in the very early years of life abound in the literature, and a few cases have been reported in which the process has been continued even as long as the ninth decade of life, these unusual occurrences are of little more than historical interest. That the function of the ovaries and of other internal secretory glands is occasionally developed prematurely is but one of the incomprehensible freaks of nature, and it should not create great surprise if in rare instances glands which usually undergo retrograde changes and lose their activity at a more or less definite period, should continue to function indefinitely.

Periodical bleeding, or menstruation, begins at an average age of fourteen to fifteen years and terminates at an average of about forty-seven. The reproductive function of the female is usually confined to the interval between these ages though not necessarily so, either in regard to the begining or the ending. It may be said, however, that unless the process is established in a manner suggesting a fairly normal state of development of the sexual organs, the power of reproduction is likely to remain in abeyance. The menstrual process must as a rule be regarded as essential and as an indication of ordinary ovarian activity and a properly functioning uterus, although this does not preclude the pregnant state before the onset of menstruation, or during periods of amenorrhoea from lactation or other causes, or after the process has apparently ceased.

To question why the female is subjected to a monthly flow of blood from the uterus is equivalent to an attempt to understand the designs of the Creator, and the many who have attempted to solve the problem by venturing opinions have left it as dark as it has always been and as it is likely to remain. To reason, however, as to its purpose, or what it is designed to accomplish, is a different matter and one concerning which an opinion may logically be expressed.

Throughout the ages much lore and superstition, sometimes mystical in the extreme, have found an origin in the occurrence of monthly bleeding. Before anything was learned of the physiological and anatomical changes attending the process the most weird ideas prevailed in regard to it. For the most part it was looked upon as a cleansing process and the menstruating female was designated "unclean." Great variations in the use of this term were in evidence and although she was sometimes allowed to hold herself aloof from her ordinary associates she was not infrequently banned from mingling with them and at times was subjected to most discourteous treatment. Superstitions accredited her with most extraordinary powers of evil in her relation to plant, insect, animal and human life, although these attributes were sometimes favourably looked upon by those who made use of her magic power of destruction to rid their fields of insects and other pests, by having her journey through them at judiciously selected times. On the other hand menstrual blood was accorded curative powers of unbounded and inestimable value. Though not entirely, such extraordinary ideas of menstruation have been consigned to oblivion and it is regarded as a natural process occurring in the life of the female and indicating that she is, under normal conditions, capable of reproducing her kind. Amongst some races the idea of uncleanliness still prevails, though not in the obnoxious sense as formerly. Some on account of religious or other beliefs are content to remain unclean to a degree, and even amongst our own people there still exists the absurd idea that throughout the menstrual period a bath of even moderate temperature should not be taken, it being admitted that one of immoderate heat or cold might be detrimental.

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*Address in gynaecology, read at the meeting of the Ontario Medical Association, Windsor, June 1st, 1923.

With advance in knowledge of the physiological and anatomical changes occurring during the menstrual cycle, the process has come to be regarded as one designed to maintain the endometrium or inner lining of the uterus in an active, healthy and suitable state to enable the uterus to perform when required its most important function in the reception, implantation and development of the fertilized ovum. As to the extent of destruction and regeneration occurring in the endometrium during menstruation, opinions have been varied. Formerly it was widely claimed that practically the whole of the endometrium was cast off and replaced by a new one, but it is now generally acknowledged that such is not the case and that the amount of actual destruction is comparatively small, although in rare cases a membranous cast may be expelled. Even this does not include the whole thickness of the endometrium. If little more than small areas of the epithelium is cast off during the monthly flow, the essential elements of the endometrium must, therefore, afterwards remain, and in practically the same proportion and relation to one another as before the flow, and yet the changes undergone by them are undoubtedly regenerative in character.

In the premenstrual stage all the endometrial elements, including the vessels, stroma cells, glands and epithelium, manifest excessive activity. They are chiefly altered in size and contour from increased vascularity with swelling and oedema and the filling of the glands with secretion. Disturbance in their proportion and relation is more apparent than real, and following the menstrual flow of blood and glandular secretion with relief of tension and lessened vascularity there is a fairly rapid return to a state existing in the resting stage of the menstrual cycle. If, therefore, it is desired to designate the purpose of the menstrual cycle by a single term, one might readily look upon it as a process of irrigation of the uterine mucosa designed to maintain it in a healthy fertile state. Its phases are apparently subject to control exercised by ovarian function and the action of the musculature of the uterus. In the entire absence of ovarian tissue it is quite exceptional for the process to be carried on.

Histological study of the ovaries has clearly demonstrated a monthly structural change in the ripening and rupture of a Graafian follicle and the development and subsequent retrogression of the corpus luteum. Such changes have a fairly definite periodicity and it has been amply demonstrated that the changes occurring in the endometrium during the menstrual cycle correspond closely in their time of incidence. The consensus of opinion is that the Graafian follicle ruptures during the resting phase and that the corpus luteum attains its highest state of development in the premenstrual state when vascular engorgement of the endometrium is most marked. That the regular periodical changes in the ovarian tissue bear a distinctly causative relation to the various phases of the menstrual cycle would appear to be well established.

Innumerable theories as to what the causative factor really is, or how it acts, have been advanced, and although much importance is attached to the corpus luteum and its probable action as an internal secretory gland, there is still a lack of definite knowledge in this matter and one cannot safely go further than to ascribe it to ovarian activity. By some the corpus luteum is regarded as the causative factor, with its internal secretion acting directly upon the uterus through its blood supply or indirectly through its vasomotor nerves, while others venture the opinion that the action of the corpus luteum is inhibitory. This latter opinion is apparently based on the fact that retrogression of the corpus luteum of pregnancy is a slowed-up process during the attending amenorrhoea. Still others ascribe to the corpus luteum both causative and inhibitory functions. That the corpus luteum is in its highest state of development in the premenstrual stage and its retrogression begins soon after the onset of the menstrual flow would at least strongly suggest that its action is distinctly causative in respect of the flow, and that after this is well established its causative property is, under normal conditions, exhausted or withdrawn or successfully combated by the uterine muscle. There is distinct clinical evidence to proclaim the corpus luteum as a causative factor, inasmuch as the severe uterine bleeding which usually occurs in the case of an active lutein cyst of the ovary is promptly controlled by removal of the ovary containing the cyst or by complete dissection of the cyst and involved lutein body from the ovary. As to the matter of control one is much disposed to believe that this is a function that may well be assigned to the uterine muscle while cessation of the flow depends upon the exhaustion or withdrawal of the causative factor, and the controlling muscular contraction of the uterus. That menstrual blood is non-clotting is probably of little significance so far as its amount or control is concerned, but it is of vast importance in allowing easy escape of the blood from the uterus without painful contractions to expel it. Apparently its admixture with the secretion of the uterine glands maintain it in a fluid state.

During different periods of life the size of the uterus is, even under normal conditions, subject to variations and it is habitual to look upon the ordinary healthy uterus of the menstruating stage of life as being of average size. Prior to puberty the uterus is smaller and is commonly described as having a relatively longer cervix and a smaller body than the average. With the development, sexual and otherwise, taking place at puberty the uterus assumes the adult type, its body enlarging and its cervix shortening. Beyond the menopause the uterus undergoes a general diminution in size but does not return to the infantile type. This change is apparently atrophic. During pregnancy the uterus undergoes marked enlargement; following the termination of it, it returns gradually to its ordinary size or nearly so.

The blood supply of the uterus springs from a source which is abundant, coming as it does from the bilateral anastomotic circle formed by union of the ovarian branch of the abdominal aorta, and the uterine branch of the internal iliac artery . This circle is tortuous so as to permit of adequate supply to the vastly enlarged uterus of pregnancy, as well as to provide a well disseminated arterial supply throughout the uterus. It is worthy of note that the anastomotic circles run alongside the lateral borders of the uterus and that no large arterial branch penetrates its wall.

In order to give a well diffused circulation through the uterus the anastomotic circles give off numerous branches which penetrate the outer third of the uterine wall and for the most part bifurcate at the junction of the outer and middle thirds. One branch runs anteriorly and the other posteriorly at this junction and in many instances these vessels anastomose with their fellows of the opposite side. The outer third of the uterine wall is supplied mainly by branches from these vessels which tend to run in a circumferential direction. The inner two thirds of the wall are supplied by other branches which mostly run in a radial direction towards the cavity of the uterus and which terminate in the arterioles and arterial capillaries of the endometrium. The walls of these vessels are thick, elastic and resistant. Such an arrangement of the source of blood supply would appear to be an ideal one for the purpose of irrigation, its essential features being free and well diffused distribution with adequate pressure to meet the demands.

Provision for the return flow is in accord with a somewhat similar arrangement. Venous capillaries and venules are abundant in the endometrium and practically constitute an endometrial plexus. At the junction of the middle and outer thirds of the wall there is a freely communicating myometrial plexus of veins, while peripheral to these are various branches assuming a lateral direction towards the veins in the fibro-cellular tissue within the broad ligaments, and on through them to the uterine and ovarian veins. Connecting the endometrial plexus with the myometrial plexus are numerous veins which mostly follow a radial direction. The walls of the veins are thin, easily collapsible and are devoid of valves. Pressure within them is subject to control by the uterine muscle. This arrangement for the return flow would also appear to be ideal for the purpose of irrigation and quite adequate to meet the demands under circumstances in which a proper balance is maintained.

As an example of the maintenance of a proper balance between blood supply and its return, attention is directed to the infantile or prepuberty uterus. Being small and less contractile than later on, its supply is at all times adequate to penetrate its walls and readily reach its maturing endometrium, and the return system is not over-loaded. Under these circumstances the need of periodical irrigation does not exist and a break in the return system rarely occurs. In the pregnant uterus one of the earliest recognizable changes is softening, and as implantation of the impregnated ovum is seldom coincident with a break in the irrigation system, as a result of the continued and increasing softening of the uterine wall the adequate and increasing blood supply is taken care of by the expanding return system and a proper balance is maintained. During lactation, until such time as the uterus regains its preparous state a break in the system is unlikely, while in the rare cases of super-involution the blood supply is diminished to the actual needs of an atrophic and non-functioning uterus and a break rarely occurs. So too, in the postmenopausal uterus which is progressively atrophic a lessening supply is equal to the demand.

With the increasing development of the uterus at and after puberty, its size is increased and its firm consistency established. It is prepared for the eventuality of pregnancy. There is a need of a greater blood supply while the difficulty of thorough diffusion is increased. The distance to the endometrium from the source of supply is increased, while the uterus has acquired a greater degree of firmness and contractile power, both of which may to a degree embarrass the channels of supply in their attempt to flush the uterine mucosa and so maintain its healthy state of fertility. To accomplish this purpose, therefore, periodical irrigation is the established procedure.

In the resting stage of the menstrual cycle one often finds that in curetting the endometrium very few scrapings are obtained and there is a marked degree of firmness exhibited by the curetted wall. Scrapings examined at this time show a low degree of vascularity, and elemental inactivity. Examination of the interior of a uterus removed during the resting stage generally reveals pallor of the endometrium. Both of these findings are distinctly opposed to those in the premenstrual state. If the resting stage were to be continued indefinitely it is inevitable that the endometrium would on account of continued low vascularity become atrophic and devoid of fertility.

It is conceivable that satisfactory irrigation might be carried out and a proper balance between supply and return maintained, and undoubtedly this does happen at times, when a flow is not established, though expected. Cases are not uncommon in which all the ordinary menstrual symptoms are present except the flow. In others the flow consists of glandular discharge only. In the amenorrhoea of acute illnesses as typhoid or other infectious diseases, or following severe surgical operations or incident to climatic, nervous or other causes, the process of irrigation is not necessarily in abeyance even though there is no flow. Resulting changes in the musculature of the uterus may be responsible for maintenance of balance.

Menstruation or the monthly flow attending the menstrual cycle is the result of a break in the irrigation system of the uterus, or a loss of balance between supply and return. The loss of balance is brought about mainly by the greater embarrassment of the return system by the active musculature of the uterus. As a result of uterine contractions the thin walled veins are more affected by pressure than the arteries so that while irrigation is progressing there is engorgement of the terminal circulation in the endometrium with resultant swelling and edema of its elements. If at this stage the uterus relaxed and so relieved the pressure on the return system, a balance might be maintained without a break. Otherwise, as usually happens, there occurs a break in the irrigation system and the tension is relieved either by actual oozing or by diapedesis or both. Although the uterus is somewhat expanded and perhaps slightly softened in the premenstrual state it cannot be said to be more than a little relaxed. If it relaxed before the flow there might not be a flow, and if it remained relaxed after the flow began this would be continued.

As previously stated the causative factor in this periodical process of irrigation is ovarian activity. Whether, or to what extent, this is influenced by the activity of other internal secretory glands is still a matter awaiting solution. Also as already stated, exhaustion or withdrawal of causative factor allows the uterine muscle to regain and maintain control. Periodical bleeding will depend upon the amount of causative factor and the ability of the uterine muscle to control, and its amount and duration will also depend upon these.

The uterus is a highly organized muscular organ with powers of contracting, relaxing and expanding, and is capable, under ordinary circumstances, of controlling the amount of blood passing through it. Normal menstruation indicates a fairly constant state of lost balance between the causative factor and the control, while an excessive flow suggests that the loss of balance is greater than the ordinary. Uterine bleeding may therefore become uterine haemorrhage when there is an excess of causative factor or when there is a deficiency or lack of control.

Each individual female is a law unto herself. The amount of her flow is generally so constant that any unusual departure is easily recognized, and in the investigation of any case in which the flow is affected it is of paramount importance to get all the information possible regarding her normal menstruation so as to judge the significance of any change. Also in respect of any alteration minute details are of great value. Excessive causative factor is due to increased or prolonged ovarian activity, although in some instances it would appear that the activity of other internal secretory glands, and notably the thyroid, has some indirect causal relation. Lack of control may be due to deficient or ineffective contraction of the uterine muscle or to abnormal relaxation or persistent relaxation after the break has occurred, or to the task of taking care of an abnormal quantity of blood during abnormally active or prolonged passive congestion of the irrigation system.

Following the onset of menstruation at puberty, it not infrequently happens that there is excessive and prolonged bleeding. In many of such cases there is concomitant enlargement and over-activity of the thyroid gland and possibly some disturbance of the pituitary and adrenal glands as well. Haemorrhage in these cases is no doubt the result of hyper-activity of the ovaries, influenced perhaps by the other glands, and the abnormality generally corrects itself in the course of a few months, and seldom calls for treatment other than constitutional and hygienic. Clinically the most notable example of excessive causative factor is the case of an active lutein cyst, already referred to above. In such a case the haemorrhage is frequently severe and is prolonged. Failure of control is also present as the uterus is abnormally relaxed. Dilatation of the uterus can be accomplished with the greatest ease. Removal of the lutein body permits of a rapid adjustment between cause and control.

Regarding the controlling power of the uterine muscle, nature affords the most splendid example in its action in child-birth immediately following the detachment and expulsion of the placenta whereby owing to muscular contraction the placental sinuses, or much enlarged uterine veins, are blocked by compression, and reflux bleeding, or post partum haemorrhage, is prevented, pending permanent closure of the veins by clotting and organization. Failure of contraction of the uterine muscle following the expulsion of the placenta leaves the break open and permits an active reflux from the valveless uterine veins and haemorrhage is inevitable. Further, in case of decidual or placental retention with only partial detachment the uterus tends to remain relaxed and the veins in the area in which separation has taken place remain unblocked, and there is reflux bleeding often amounting to haemorrhage. Efficient post partum uterine contraction precludes the occurrence of reflux bleeding, and the lochial blood and discharge are exuded from the uterine mucosa during its involution and until the balance between supply and return is restored and the break is sealed.

Uterine haemorrhage may be due to uterine or extra uterine causes, most of which are recognizable without any extraordinary difficulty. There are two types of haemorrhage, namely, periodical and non-periodical, the former being subject to control and the latter not.

For practical purposes one is in the habit of placing all gynaecological conditions in three groups,—first, those due to disturbed pelvic mechanics,—second, growths and tumours, and third, infections. Haemorrhage may manifest itself as a symptom in any of these groups, but the reason for its appearance is subject to considerable variation. In the first, which includes retroversion and prolapse, the uterus is frequently maintained in a state of passive congestion and there is torsion and fulness of the veins in the broad ligaments. When the break in the irrigation system occurs there is sometimes a freer unloading of the uterine vessels than is normal.

In the second group, that is, growths and tumours, excessive bleeding is generally the result of lack of muscular control either by deficient or ineffective contraction. In so-called clinical fibrosis of the uterus in which it is generally enlarged and firm and sometimes expanded, the muscle appears to be inelastic and to lack contractile power and when the break occurs an unusual degree of reflux through the radial veins is permitted. This condition is frequently associated with some chronic diseased state of the adnexa. In fibro-myomata of the uterus it is mostly due to ineffective uterine contractions owing to the fact that the anatomical relations between the tumour and the uterus are such as to deprive the muscle of its control of the radial veins and the capsular veins of the tumour, so that in the presence of a break a haemorrhagic reflux is likely to occur. Subperitoneal fibroids do not cause haemorrhage as they do not interfere with the action of the uterine muscle. Interstitial or intramural fibroids do not cause haemorrhage so long as they are surrounded by a substantial layer of uterine muscle which can exercise control over the radial and capsular veins to prevent reflux. Submucous fibroids, however, almost invariably allow menorrhagia, or excessive periodical flow to take place owing to the disappearance of muscular tissue between the tumour and the endometrium with the consequent failure of muscular control over the valveless radial and capsular veins. When a submucous fibroid becomes pedunculated its vessels are practically beyond the control of the uterine muscle, and besides the occurrence of menorrhagia there may be metrorrhagia or non-periodical bleeding as well. In a uterus which is studded with numerous small fibroids without any of them being submucous, some excess of bleeding may occur on account of general interference with muscular contraction.

Malignant disease in the body of the uterus may not affect the flow in its early stage but later on account of the increased activity in the area of mucosa affected and the development, in the growth, of vessels which are removed from the area of muscular control there may be menorrhagia. Still later owing to breaking down of the proliferating mass with inevitable involvement of vessels metrorrhagia occurs. Such bleeding due to ulcerative processes is irregular or non-periodical and not subject to muscular control. In some cases before the menopause and in all cases beyond this, metrorrhagia is the first irregularity observed. A benign polypoid condition of the endometrium may produce excessive bleeding because its newly formed vessels are beyond the control of the uterine wall, and it is indicative of localized increased vascularity.

In early uterine pregnancy, if after implantation of the fertilized ovum the uterus is sufficiently softened before the next periodical irrigation is due, the balance between supply and return is maintained and a break does not occur. If, however, implantation is late in the menstrual interval and the uterus is not sufficiently softened when the next irrigation is due a break may occur and in this way it not infrequently happens that the beginning of pregnancy antedates the last menstrual flow, although as a rule in such cases, the flow is a diminished one. In rare cases of pregnancy there is a monthly flow during the first three of four months. This would tend to indicate that some localized area of the uterus has not become sufficiently softened to permit a proper balance between supply and return, or that there is localized excess in the irrigation. In the very exceptional case in which menstruation continues throughout pregnancy the defect fails to remedy itself.

It is noted that early uterine abortion is more likely to occur at a time corresponding to a menstrual period or closely following such. This is probably due to a break in the irrigation system at a time when there should be a proper balance between supply and return, and through a break at such a time when there is general increased vascularity, the amount of blood escaping may be so great as to disturb the attachments of the implanted ovum. The frequency of early uterine abortion at such periods and the occasional occurrence of menstruation during pregnancy provides clinical evidence of continued ovarian activity and periodical irrigations during pregnancy. The occurrence of accidental haemorrhage in the later months of pregnancy is probably due to a break in the softened channels from overloading during a process of irrigation. Bleeding in placenta previa is purely mechanical on account of blood channels being opened up by separation of a portion of the placenta from the expanding lower uterine segment.

It is a significant fact that pregnancy is normally terminated at a period which ordinarily corresponds to the resting stage following the ninth periodical irrigation. At this time the child in utero has recently assimilated its last transfusion or shower of maternal blood and the uterus is in the best condition for undertaking the work of expulsion of the child and the subsequent control of its own circulation. That separation of the child from the mother is deferred until nine months have elapsed is no doubt due to nature's wise provision for the full development of the child and its safety when assuming its separate existence. Though viability is attained earlier it is by no means as certain, and in respect to all growth nature has set a time for its various phases and the fulfilment of its purpose.

In ectopic pregnancy which in practically all cases is primarily tubal, there is usually a missed period or if not there are practically always some details regarding the menstrual history which suggest a departure from the normal, as for instance, the regular periodical flow comes on and may equal the average or be less or greater in amount and duration. Then a few days after its cessation there may be a recurrence though often differing in character. Clinical observations during many operations for ectopic pregnancy have convinced one that its softening effect upon the pelvic organs is almost as great in a general way as early uterine pregnancy and that in respect to the involved adnexa and the tissues bearing them it is much greater. The pregnancy constitutes a centre of an area of markedly increased vascularity. This local increase has the effect of attracting blood away from the irrigation system of the uterus while at the same time the uterus is softening. Therefore in many instances when the ensuing periodical irrigation of the uterus takes place a balance between supply and return may be maintained without a break, while in other earlier instances where less of the supply is attracted from the uterus and easier return is not yet established, the usual break occurs.

Haemorrhage is a symptom frequently observed in ectopic pregnancy, but as a rule is not severe. It is irregular and small in amount and the blood is usually darker and more brownish in color differing from fresh blood from the uterus. In most cases it is a flow from the affected tube through the uterus and indicates that haemorrhage is going on in the region of the ovum. When more recent in appearance and larger in amount it tends to indicate a break in the endometrial channels on account of excessive engorgement and overactivity of the mucosal elements. One's own observations lead one to believe that the formation of a decidua is uncommon. Certainly the expulsion of a decidual cast is a rare event. In only one of the writer's cases has such a cast been observed and that was expelled after operation. The finding of decidual-like cells in curettings from the uterus while tubal pregnancy exists by no means indicates the formation of a decidua. Their presence is significant of marked activity of the stroma cells.

Pathological conditions of the cervix of the uterus may and frequently do, give rise to haemorrhage, and as the tissue involved is beyond the control of the uterine muscle, such bleeding will usually be non-periodical, although in some conditions as catarrh or cervical polypus it may be coincident only with the menstrual period with a tendency to prolongation and to occasional intermittent activity. By far the most important disease of the cervix is cancer and its earliest symptom is bleeding. At first it is almost insignificant in amount, and when free it generally indicates a fairly advanced state of disease. As in cancer of the body it is due to the breaking down process following some proliferation, and not being subject to uterine control, it is of necessity irregular. As compared with cancer of the body, haemorrhage, as a symptom, occurs somewhat earlier on account of earlier added infection from the vagina tending to hurry the ulcerative process.

Twisting of the pedicle of an ovarian tumour may cause mild uterine bleeding, and as this has been observed in at least two of one's cases in women several years past the menopause as well as in a few cases prior to the menopause, it is concluded that the break is a direct effect of back pressure in the return channels on the affected side by reason of the torsion involving the veins of the broad ligament.

In infections, or conditions in our third group, there may be excessive flow at the menstrual period and not infrequently the occurrence of the flow is precipitated. Both may be the result of active congestion attending the inflammatory process resulting from the infection. Active over-engorgement of the vascular channels causes a greater loss when the break occurs, while on account of the overloading, the break occurs earlier than under an ordinary load. Hence, in cases in which there is a sudden precipitation of the flow with excess in amount the possibility of infection should always be considered. If added to these there is pain, a symptom so commonly produced by active vascular engorgement, infection is even more strongly suggested. Besides having a direct causal relation to increased bleeding in this manner, infection may act indirectly. By the continual involvement of the adnexa with increased congestion the ovaries may temporarily manifest over-activity with a consequent excessive production of the causative factor. That this event may assume even extreme proportions is evidenced clinically by the occasional occurrence of rapid haemorrhagic cystic degeneration of one or both ovaries in the presence of infection either local or general with associated and free uterine haemorrhage. A case of this kind occurred in the writer's experience in a patient suffering from a severe attack of influenza. Infection may also act upon the wall of the uterus with resulting diminution of its contractile power and ability to control.

The addition of infection to such conditions in group No. 1, or 2, as may be complicated by infection will naturally tend to increased vascularity with consequent increase in haemorrhage as a symptom, and may even induce haemorrhage where previously it was absent. In cancer, as stated above, added infection induces earlier and increased bleeding. Infection of a fibroid tumour of the uterus gives it greater power as a cause of bleeding, and fibroids which may not be active in this way may have their activity much increased by infection.

Notable in this regard is the process of necrobiosis or red degeneration of a fibroid, a transformation which one believes is always the result of infection, either local or general. Most of such cases occur shortly after childbirth or abortion, and their clinical course would certainly suggest an infective cause. One has seen in a woman of twenty-five, recently confined, a large submucous fibroid degenerate, break down and become expelled through the cervix. Infection was obvious although localized in the tumour area.

Two of the most typical cases of acute red degeneration of a fibroid tumour coming under one's care were seen in the convalescent stage of severe influenza. One of these was in a woman who was approaching the menopause and had not been pregnant for over ten years, and the other in a woman of fifty-four who though having had excessive bleeding at her periods some time previously ceased to menstruate, and during her influenza had a severe recurrence of bleeding which continued until she was relieved by hysterectomy. Other types of degeneration so prone to occur in fibroid tumours especially about the time of the menopause usually tend to an increase of haemorrhage. It is quite possible that in many such cases infection of unrecognized origin may be the cause, although in many others inadequacy of vascular supply is the responsible feature.

In occasional cases in which the menstrual flow is scanty or absent there occurs a periodical flow of blood from other and remote mucous membranes, and more commonly from the nose. Also is some cases even with a normal menstrual flow there is vicarious menstruation. The rationale of this procedure is difficult to determine and can only be assigned in an indefinite way to some abnormal activity of the internal secretory glands. In the case of a young girl of eighteen seen in consultation recently, since the onset of her menstruation about two years previously, she had monthly and often profuse nose bleeding just prior to the appearance of the monthly flow. She lost much blood and became very weak. At the time of consultation she was bleeding profusely from the nose and her menstrual period was almost due. Her pulse was thready and its rate about 150. She was absolutely blanched and her breathing was very difficult. It was possible to check the nasal haemorrhage and transfusion would have been performed had she not died in a few hours, before it could possibly be arranged. It is doubtful, however, whether this would have been of any benefit in such an extreme and dying condition.

A young girl was recently admitted to the Gynaecological Service at the Toronto General Hospital menstruating for the first time and in such a state of exsanguination that all efforts to save her life were unavailing. In a case of this kind which is fortunately very rare, there is a complete loss of balance between causative factor and control, the latter being entirely in abeyance allowing a continued reflux from the vascular channels in a manner analogous to post partum haemorrhage. This and some other cases of less severity, even from other causes, may be regarded as post menstrual haemorrhage.

The haemophilic diathesis may in these rare cases of severe or vicarious menstruation have an important bearing, but in respect of uterine bleeding, loss of control is an essential feature.

Various general disturbances and particularly of a nervous character may influence the amount of the menstrual flow and may even alter its periodicity. Their influence must be exerted through the internal secretory glands, the ovaries acting as the medium and at the same time affecting the neuro-muscular mechanism of the uterus. Like other problems, however, suggesting disordered activity of the internal secretory glands, their explanation is difficult or even impossible.

Visceral disease involving the heart, kidneys or liver is sometimes attended by disturbance of the menstrual flow, while in women past the menopause a not uncommon cause of irregular uterine bleeding is high blood pressure. The uterus is generally atrophic and its inner vascular channels are in a weakened, exposed and preapoplectic state. In such cases as this bleeding may be beneficial and one has commonly had the patient express a feeling of improvement after its occurrence. It is of course most important to rule out the possibility of malignant disease as it is in any other case of irregular, uncontrolled non-periodical bleeding. In fact in the presence of this important symptom, it is a good rule to regard the condition as malignant until it can be decided after thorough investigation that it is or is not. Every possible doubt should be reduced to the minimum.

It has been noted that in the presence of fibroid tumours and also in some other diseased conditions of the pelvic organs, the menopause is delayed. If this is so, it can only be through prolongation of ovarian activity and it is difficult to understand why this should happen any more frequently because of the presence of disease than it does under more normal conditions. It is more than likely that it does not, as there is probably as great a proportion of women with a delayed menopause who, not having disease with attending symptoms, do not come under observation. It is perhaps more authentic and worthy of note that many women with gross pathological conditions involving their pelvic organs do not suffer any excess or prolongation of the menstrual flow. This would indicate that even in the presence of gross disease a proper balance between supply and control may be maintained.

As one's clinical experience enlarges one is more convinced that the uterine muscle has and does perform a most important function in the control of the blood passing through its vascular channels. The whole mechanism of the uterus is intricate and extraordinary in its completeness, and from a clinical point of view the writer believes that the observations contained in the foregoing paragraphs, and which are mainly founded on opinions gradually developed out of one's practical work, afford at least an idea of the subject of uterine bleeding and the causes of uterine haemorrhage which is distinctly applicable in the daily routine of gynaecological practice.

UTERINE HAEMORRHAGE*

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ALTHOUGH a formidable mass of literature has been accumulated on the subject, even so far as to make it appear hackneyed, I doubt if uterine bleeding is generally estimated seriously enough. In the voluminous literature the vital matter, which is the treatment and relief of the suffering patient, is often so buried under reiteration and discourse on etiology and theory that it is difficult for the busy practitioner to find the practical help he seeks. But the treatment of uterine haemorrhage is constantly improving, however unsolved the obscure points of etiology remain. The object of this paper is primarily to urge an increased vigilance in the presence of this common symptom of a serious gynaecological condition, to emphasize the necessity for skilful differentiation in diagnosing its origin, and to caution the too sanguine or hasty diagnostician when proceeding to treatment. Uterine haemorrhage is only a symptom, but in many cases it is the first and sometimes the only symptom, as you all know, which attracts attention to a grave condition. It is a symptom which always demands treatment. Let me impress on you that it is a symptom which arises from so great a variety of pathological derangements, that every medical man should make himself as familiar as possible with its causes.

It is not intended here to cover the treatment of uterine haemorrhage associated with pregnancy or general conditions, but to make a comprehensive classification it is necessary to include all the causes associated therewith. To present them in a convenient form, the various causes may be listed in three main groups.

(A) Constitutional causes.
(B) Those associated with pregnancy.
(C))Local causes.

(A) Under constitutional causes may be mentioned:—(1) Syphilis, (2)hemophilia, (3) anaemia, especially pernicious anaemia, (4) phthisis, (5) hyperthyroidism, (6) scurvy, (7) rheumatic diathesis, (8) infectious diseases, (9) cardiac disease, and (10) hepatic disease.

Such bleeding naturally comes under the care of the physician rather than the gynaecologist. The cause of the haemorrhage is usually evident from the general condition of the patient, and it is seldom that the bleeding requires special attention.

(B) Under the second group we may mention:—(1) Threatened or incomplete abortion, (2) extrauterine pregnancy, (3) pregnancy in one horn of a bicornuate uterus, (4) vesicular mole, (5) Choriocarcinoma, (6) accidental haemorrhage, (7) placenta previa, (8) retained secundines, (9) sub-involution. These conditions usually require very prompt and accurate diagnosis and often surgical interference. If they were mistaken for some of the conditions which are enumerated later, they would undoubtedly result fatally. It is essential, therefore, that anyone treating uterine haemorrhage should not only be familiar with obstetrical conditions, but should be able to deal with them efficiently—surgically if necessary. On the other hand, one must never forget that many conditions which cause uterine bleeding may be complicated by pregnancy, and the pregnancy not be suspected because of the bleeding.

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(C) Coming now to the third group of cases due to local causes, one finds that there are many conditions which are difficult to classify, but the following enumeration will fairly well cover the subject, at least for the illustration of the cases I wish particularly to discuss, namely, those most suitable for treatment by radium. (1) Carcinoma of the uterus, (2) sarcoma of the uterus, (3) retro-displacements, (4) tuberculous endometritis, (5) senile vaginitis and endocervicitis, (6) disease of the adnexa, (7) fibrosis uteri, (8) hyperplastic glandular endometritis, (9) leiomyomata.

In all these local conditions medicines are practically valueless. The treatment required is some form of surgery or radiation.

(1 and 2) In malignant disease of the cervix or body of the uterus, the first symptom which brings the patient to the physician is almost always uterine bleeding. If these cases are seen and recognized as soon as the bleeding begins, they can usually be cured, for in the early stages they are local diseases. If the bleeding is not considered of serious import, and temporary measures are adopted or any form of treatment is instituted other than that which aims at complete eradication, the case soon becomes hopeless. Frequently it is necessary to do a biopsy and, in fact, in practically all cases of possible malignancy careful examination under an anaesthetic and a diagnostic curettage ought to be compulsory.

There is no unanimity of opinion as to the best method of treatment, but I, personally, do not believe that in this condition the use of radium or x-ray, alone or in combination, has yet been justified. The results from the two-stage operation of cautery followed by panhysterectomy, are still, for me, a surer method of eradicating the disease; nor do my results warrant me in radiating either before or after radical operation; nor do radium or x-ray in *inoperable* cases give better results than the cautery. The cautery has fallen into disfavour because its difficult technique has not been studied. All that one can hope to accomplish with either the cautery or radium, is the destruction of the local growth. With the careful use of the cautery one can destroy as much as one wishes, whereas with radium and x-ray this is very difficult to regulate. The pain and discomfort after cauterization is, if anything, less than the pain and vomiting which is often occasioned by radium and x-ray. The Paquelin cautery is absolutely useless in these conditions; nor is the Percy method of cauterization, as generally understood, to be recommended. A heavy electric cautery similar to or of the Percy type, used through a water-cooled speculum, is required, and the cauterization must be done to the limit of danger as regards fistulae.

These conclusions are based on my experience in 64 cases, which are not selected but include every case of malignancy seen in my practice in Toronto up to January, 1918. There was a definite pathological diagnosis in each instance and they were all treated by the cautery or operation, or a combination of these methods. Of the 64 there are 18 living and well, five years or more after treatment. These results are vastly superior to those of later years when I was employing radium or x-ray, and until the advocates of radiation can demonstrate a definite technique of application and dosage giving better results, the two-stage operation is the one of choice.

(3) Retro-displacement of the uterus is not always an operative condition, but if abnormal bleeding is one of the prominent symptoms, it is wiser to deal with this symptom surgically than to use radium or x-ray, owing to the frequent association of tubal inflammation.

(4) Tuberculous endometritis. With our present knowledge, radium and x-ray should not be used in these cases, as tuberculosis of the adnexa is often also present; the condition is a surgical one, and at the time of operation the tubes and ovaries are dealt with as required.

(5) Senile vaginitis and endocervicitis are usually found in old women, where there is a tendency for the mucous membrane to bleed. They can be cleared up more easily and effectively with the Paquelin cautery than with radium or x-ray.

(6) Disease of the adnexa is an absolute contra-indication to the use of radium and x-ray. It is in this class that the injudicious use of these agents causes most trouble. There-

fore, because inflammation of the tubes and ovaries frequently accompanies so many other conditions, *e.g.*, leiomyomata, fibrosis uteri, etc., I am convinced that neither radium nor x-ray should ever be applied in any circumstance without careful examination both without and with anaesthesia.

(7) Fibrosis uteri is a clinical term rather than a pathological entity. The majority of cases of fibrosis uteri are of the sub-involution type, with both the muscular and fibrous tissue increased. The blood vessels are thick-walled and there is considerable perivascular infiltration and increase in elastic tissue. Besides this large, hard type of uterus, there are the small, sclerotic uterus and the large, soft, flabby uterus which bleed abnormally. Sometimes we may find such a uterus in which there has been no abnormal bleeding, consequently the histological findings in cases of fibrosis uteri are not of paramount importance. The most constant finding is a glandular hyperplasia, in which there is a marked increase in typical glands. In this group must also be considered the cases of so-called idiopathic haemorrhage, which show no pathological change and which are theoretically explained as caused by some disorder in function of the endocrine glands. Whether this be true, or whether the bleeding is caused by the changes in the myometrium and blood vessels, treatment must be directed against the bleeding uterus, and radium is the method of choice. Although we might theoretically hope for some benefit from the administration of the extract of various glands, it has been useless in my experience. Examination under anaesthesia and a diagnostic curettage should always be done, and, in absence of contra-indications, radium introduced into the uterus at once. Dosage varies from 200 mgm. hours to 1500 mgm. hours, depending upon the size of the uterus and whether it is desirable to produce an artificial menopause, and with properly estimated dosage one treatment is sufficient.

(8) Hyperplastic glandular endometritis and polypus are the same pathological condition, one being diffuse and the other focal. The glands are increased in number, lined with a single layer of epithelium, and there is no invasion of the muscularis and no mitosis. Bleeding from such a condition can be relieved for several months by curettage, but the condition tends to recur. The uterus may not be enlarged but usually is. These are the cases which were formerly subjected to repeated curettements, but are much more efficiently treated by radium, taking into consideration, of course, the absence of contra-indications and the age of the patient as to dosage.

(9) Leiomyomata. This is a much better term than fibroid: it includes tumours in the uterus arising from unstriped muscle. The stroma of these growths is composed of fibrous tissue and represents the reaction to the invading tumour cell. They are, therefore, of varied consistency, being soft if there is a predominance of unstriped muscle, and very hard if there is a predominance of stroma or fibrous tissue. They may occur in any part of the fundus or cervix, may be large or small, or may be extruded from the uterine wall and become pedunculated either as subperitoneal or intra-uterine fibroids. They are subject to various degenerations, and the situation and condition of the tumour or tumours must be determined before any form of treatment is decided upon. It is in the choice of treatment of leiomyomata that controversy is apt to arise. The operations of complete and subtotal hysterectomy have been brought to such a high degree of technical perfection, that it is difficult to persuade skilled operators that any other form of treatment is applicable. On the other hand, the results of treatment by radium and x-ray are now so well established, and the results often so brilliant, that the devotees of radiation are apt to be over-enthusiastic. But neither the surgeon nor the radiologist should have too narrow a point of view. With our present crystallized knowledge from experience and observation, it ought not to be difficult to lay down certain definite principles upon which we can agree. Even if one is practically certain of the successful termination of a hysterectomy, one must regret the necessity of a serious, painful operation.

It has been shown that the most constant effect produced by radium is a marked change in the intima of the blood vessels, the end result being similar to an endarteritis obliterans. Since the x-ray and radium have been used extensively, it has been shown that both radium and x-ray affect the ovaries, producing changes in the superficial cells. However, the cessation of bleeding is not entirely due to the change in the ovaries, as is proven by the fact that uterine bleeding occasionally occurs after removal of both ovaries. It is often seen that haemorrhage occurs after the menopause. Both radium and x-ray have a specific effect on fibrous tissue, for either will successfully remove keloids.

A definite principle which I have established for myself in treating uterine haemorrhage, is that radium is the treatment of choice in idiopathic haemorrhage, fibrosis uteri and hyperplastic glandular endometritis. The dosage must be carefully regulated according to the age of the patient. Full dosage will always produce artificial menopause. Radium is also indicated in leiomyomata not larger than a 3½ months pregnant uterus in women over forty years of age. For young patients, a myomectomy is to be preferred; if a hysterectomy must be done, one or both ovaries can be left. Radium is further indicated in poor surgical risks, those suffering from cardiac, renal or tuberculous disease, those profoundly anaemic, and very fat women. Large, pedunculated, subserous or submucous leiomyomata, suppurating, necrotic or gangrenous tumours and those showing cystic or calcareous degeneration, leiomyomata complicated by ovarian tumours or tubal inflammations and tumours producing marked pressure symptoms, must be dealt with surgically.

If radium can be used at all it should be preferred because of its safety. There is practically no mortality and there should be no morbidity in carefully selected cases. The patient is relieved of mental and physical suffering occasioned by an operation, less anaesthesia is required, there is an economic saving in hospital charges and special nurses and time saved for the individual patient. Sufficient cases have now been under observation to show that a tumour will shrink after the use of radium, and that if a proper dosage is given, haemorrhage will be checked. We have yet to see the case where after using radium, there has been no shrinkage of the tumour. Unfortunate results due to improper dosage and improper screening should not occur. Even the leucorrhea, so often reported at first as a sequela of radium treatment, is now unknown. The possession of an alternative resource is a great boon. A myomectomy, for example, may now be ventured more confidently than formerly, because, if haemorrhage does recur, it can be checked by radiation; or, if one uses radium in the first place in a selected case and it proves unsatisfactory, surgical treatment can still be tried.

Radium in gynaecology is to be preferred to x-ray, in the first place because it can be more directly applied, in the second place because its action on the ovaries can be more certainly controlled than can the x-ray. The fundamental fact that both radium and x-ray decrease in their action inversely as the square of the distance makes these statements self-evident. The ovaries are less liable to damage from the ray when it is projected directly from within the uterus than when it is projected from an x-ray tube outside the body and about equi-distant from them and the uterus. X-ray technicians believe they can screen the ovaries, but the exact position of the ovaries can often not be positively demonstrated even by examination under anaesthesia. We find that when a cessation of menstruation has been temporarily produced by radiation, the function returns more quickly after radium than after x-ray application. An examination under anaesthesia is required in either case to rule out conditions where neither should be used. If there is no contra-indication to radiation, a further advantage of radium is that it can be inserted in the uterus at once, and in practically all cases only one treatment is necessary; with x-ray repeated treatments are generally used. Indeed, although insisting on its circumscribed sphere in gynaecology, I believe radium to be so indispensable an agent, as to have become as necessary to the gynaecologist as a cautery or a scalpel.

My technique is to screen the radium needles in their brass container and then in black or gray rubber tubing. It is placed accurately in the uterus and held securely in position by a catgut suture through the cervix and the rubber tubing. A full length catgut suture is used and tied by a slip knot which can be easily loosened when the radium is to be removed. 1,200 to 1,500 mgm. hours will produce an artificial menopause. If menstruation is not to be stopped completely, 150 to 600 mgm.

hours, according to the size of the uterus and the age of the patient, is the dosage.

In almost 40% of the cases on which I would formerly have operated, probably doing hysterectomies, I now use radium. The remaining 60%, however, still require surgery. Radium, x-ray and surgery are not competing; they are not antagonistic; we should determine what is best in a given case and must be careful not to generalize too much.

Conclusions. 1.—The importance of impressing upon both the public and the profession that any abnormal uterine bleeding requires most careful investigation as soon as it appears.

2.—The application of radium or x-ray in gynaecological cases should be under the supervision or be conducted on the advice of a physician or surgeon skilled in gynaecological examination and diagnosis.

3.—The decision as to the choice of treatment should not rest with the radiologist unless he is specially trained in gynaecological diagnosis.

4.—It should be an axiom that radium or x-ray should not be used until an examination under anaesthesia has been made, and if necessary, a diagnostic curettage or biopsy done.

5.—Neither the surgeon nor the radiologist should have only one point of view.

6.—The use of radium is contra-indicated in cases of (1) inflammatory lesions of the tubes or ovaries; (2) leiomyomata larger than a 3½ months pregnant uterus; (3) large, pedunculated, subserous or submucous leiomyomata; (4) leiomyomata showing any form of degenerative change; (5) leiomyomata complicated by ovarian tumours; (6) leiomyomata producing marked pressure symptoms.

7.—Radium should be used with great care in young patients in whom it is desired to retain active menstrual functions.

8.—Radium is the treatment of choice in (1) leiomyomata not larger than a 3½ month pregnant uterus in women over 40 years of age, (2) fibrosis uteri, (3) hyperplastic glandular endometritis, (4) polypi, (5) patients who are poor surgical risks.

9.—Dosage—depends upon (1) the size of the uterus, (2) the age of the patient, (3) whether the function of child bearing is to be preserved or sacrificed.

10.—Complications and unfavourable results are to be avoided only by a careful, discriminating, differential diagnosis.

Epidemiology of Colds in Infants.—Five hundred cases of colds were studied by Walter Fritz Winholt and Edwin Oakes Jordan, Chicago. There was a distinct history of a cold in some member of the family in 290 of the 500 families in which a baby had a cold, but in only 180 of the families to which the normal babies of the control series belonged. That is, 58 per. cent. of the babies having colds at the time they were brought to the infant welfare stations had presumably been more or less in contact with other cases of cold in their respective families, while only 36 per cent. of those without colds had been subject to similar contact. Figures given seem to indicate that in families in which there are babies with colds there is much more likely to be a history of cold in the mother than in families in which the babies are free from colds, but that the occurrence of a cold in the father is not manifestly related to a cold in the baby. In families in which members other than the mother or father, presumably in most cases other children, have colds, babies with colds are somewhat more numerous than babies without colds. The relatively close and prolonged association of mother and baby may account for the observed differences. So far as these facts go, they distinctly favour the view that at least some types of common cold are due to contact infection. The incubation period of colds is probably very short. Nearly all the babies' colds which were contracted after exposure within the family showed symptoms before the preceding patient's cold has disappeared. Coincident ailments, indicating lowered resistance, especially those of deranged metabolism, were much more common in babies with colds than in those without colds.—*Jour. Amer. Med. Ass.*, July 28, 1923.

UTERINE CURETTAGE: ITS MULTIPLE CONTRAINDICATIONS AND LIMITED INDICATIONS*

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UTERINE curettage is one of the most frequently performed surgical interventions by the general practitioner. Let us right away say that no operation is more responsible for so many complications and so frequently the cause of a further aggravation of the woman's condition.

It is a matter of regret for the sake of suffering womankind that so few general practitioners are aware of the underlying pathological conditions which are absolute contraindications to curettage in many cases of pelvic disease.

During more than 20 years of hospital connection with consequent consultations, so many complications arising out of these curettages have been brought to our attention, that it will not be out of place at the present time to discuss the conditions under which curettage must not be done and those in which it will be beneficial.

The general practitioner is a busy man. Overtaken with day and night work, little time is left him for the study of pathology during the years of his active practice. So a careful statement to-day, of the many contra-indications to the employment of uterine curettage may tend to the welfare of our female patients who deserve, in addition to our sympathy, our best of care.

Firstly, will a patient suffering from a chronic yellow or greenish discharge, sacral pains and distressful menstruation accompanied with dyspepsia, constipation and headache—in fact from the symptoms of a chronic metritis, will such a patient be cured or improved by curettage? No; curettage can do no good. (1) Because this chronic metritis is caused in the majority of cases by infectious germs; gonococci most frequently, streptococci, and staphylococci next, rarely by the Koch bacilli; all of which have with time penetrated further than the uterine mucosa, and deeply into the uterine muscle through the lymphatic spaces. (2) Because such a condition is usually aggravated by a malposition of the corpus uteri which very frequently lies low in retroposition. (3) Because it is usually accompanied by a chronic salpingitis, the result of the infection having extended to the Fallopian tubes. And thus is it not easily understandable that (A) the curetting cannot destroy the deeply seated infection in the uterine muscle; (B) cannot remedy the malposition; (C) cannot attempt to cure the accompanying salpingitis.

Not only can it not do it, but it usually aggravates the condition of the patient, because the traumatism it causes reawakens the slumbering infection and stimulates it.

Secondly, in the dysmenorrhea of the virgin or, more precisely, of the non-infected woman is it of help? It can be of little help, because with these patients the cause or multiple causes of their ailings arise from a simple stenosis of the cervix, with an acute flexion of the organ, and an underlying nervous systemic state. Only if the patient suffers from a so-called "membranous dysmenorrhoea" (*la dysmenorrhee membraneuse* of the French pathologists) may relief or improvement possibly be given by curettage, especially when this is accompanied by the improvement of other underlying conditions.

Thirdly, in the generally painful pelvis, has it any indication? (A) Here again if we have to deal with an existing salpingitis, secondary to a former infection, it is positively contraindicated. (B) If the painful pelvis is due to a tumour of the uterus or ovary no good will ensue from the curettage. (C) Often the painful pelvis in woman arises from, or is closely associated with a painful abdomen due to chronic entero-colitis, to which women are particularly prone on account of their usual constipated habit and their nervous temperament; of these a determining cause may frequently be found in a diseased appendix, or in an infected gall bladder as well as in an inflammatory condition of the pelvis.

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*Read before the Canadian Medical Association at its Annual Meeting in Montreal, June 17th., 1923.

Fourthly, is curettage of value in haemorrhage? Yes, and no; and here we come to a more practical issue. A.—If the haemorrhage is caused by a tumour, (and in such cases the uterus is both larger and harder to the examining finger) curettage, if not harmful, usually is of no avail since it cannot affect the underlying causes of the haemorrhage, that is the tumour, unless it should happen to be a small polypoid growth, and this is a very exceptional condition. B.—If we have reason to suspect a cancer—from the age of the patient, the recurring haemorrhage after menopause has already set in, the malodorous discharge, the increasing anaemia, and the dull and at times shooting pains—a curettage may be carefully done, but only in order to bring back debris for a microscopical examination. Curettage in this instance should be regarded as a biopsy rather than a surgical intervention. C.—If the haemorrhage is due to the so-called *sclerosis uteri* as met with in an elderly woman about the time of menopause, curettage is again of no avail. D.—Still more if the menorrhagia is a consequence of chronic metritis complicated by malposition and diseased adnexa as we have already mentioned curettage will seldom improve, but will rather aggravate the patient's condition. Under special circumstances it may be undertaken preliminary to a laparotomy which will allow the specialist to correct the malposition and attend to the adnexa. Usually such cases of long standing painful pelvis are better treated by sub-total hysterectomy with conservation of at least one, and if possible of both ovaries for their internal secretions. So many gynaecologists are too prone to forget that the ovaries are as needful to the woman's equilibrium and good health by their internal secretions as the same glands in man. Let all of us, and particularly the gynaecologist, not forget the old saying: *Tota mulier in utero*: the heart and soul of a woman lie in her pelvis. E.—Should the haemorrhage be a sequel to a miscarriage or confinement and should the blood flow continue for 4, 6 or 8 weeks, or show up intermittently but with frequency and abundance, curettage is indicated to clean the uterus of placental or membranous debris which is remaining *in situ* and has given rise to a fungus type of haemorrhagic endometritis.

Fifthly, in cases of acute post-obstetrical infection, will curettage help the patient? On this particular point opinion has varied. Experience has brought us to the following conclusions: (1) if the patient suffers from abundant haemorrhage which endangers her life, curettage very gently done to remove the debris, or still better a swabbing of the uterine cavity—*un curage et non un curetage*—preceded by an antiseptic and an abundant intra-uterine lavage is not contra-indicated. (2) After which we pass a rubber tube, fenestrated at the end, into the uterine cavity and leave it protruding slightly at the vulva; through it flushing of the uterine cavity can be done 3 or 4 times a day without disturbing the patient, while at the same time we assure a good drainage. (3) The administration of ergot is desirable to close the uterine muscle and prevent further absorption. (4) Vaccine and serotherapy, proteintherapy, with which we are presently experimenting, seems to have a beneficial effect in stimulating a protective leucocystosis.

Conclusions.

A.—In chronic metritis usually accompanied by malposition of the uterus and salpingitis, curettage is of no avail and rather harmful.

B.—In the dysmenorrhoea of the non-infected woman it is equally non-effective; other means must be resorted to.

C.—In acute infections following miscarriage or delivery, only in very exceptional cases is curettage to be done, and then in a very delicate manner to remove intra-uterine necrotic debris; as aforesaid other therapeutic means are to be associated.

D.—In the haemorrhagic class of cases, curettage may be advised. In cancer for microscopical research, and precision of diagnosis only; in very advanced cases the specialist may be called upon to curette and destroy vegetations too haemorrhagic and offensive. These are exceptional cases. 2.—In haemorrhage caused by tumours as fibro-myoma, curettage is seldom harmful but seldom useful. In fact curettage seems to have its principal indications in two classes of cases only; for microscopical examination in doubtful cases of cancer of the corpus uteri, and for remedying profuse and continuous haemorrhage consecutive to delivery or miscarriage. In other instances it is usually useless and generally harmful.

And we close these remarks with the words of Comyns Berkeley, which we abstract from the *British Medical Journal*, p. 90, 1923.

"Curetting is constantly abused by being performed for most of the conditions which may be attributed without adequate reason to local disease of the uterus. In a large number of cases the operation does no good on account of the peritoneal complications which ensue."

TRANSPERITONEAL CERVICAL–CAESAREAN SECTION

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THE mortality of classical Caesarean section except in specially selected cases still remains distressingly high. Beck showed that of Caesarean sections done in Long Island College Hospital, the mortality in cases treated wholly in the hospital was slightly over one per cent; in cases operated on after a test of labour the mortality was ten per cent; while in those cases known to have been handled before admission, and in which, as alas, is too often the case, the surgeon was tempted to take a chance, the mortality was sixteen per cent.

Every surgeon who has faithfully followed his fatal Caesarean to the post-mortem room knows that death, except from unavoidable causes such as eclampsia, is almost always due to general peritonitis from seepage of sepsis through the uterine suture line.

As early as 1907 Frank of Cologne tried to prevent this by reviving the old discarded extra-peritoneal approach to the uterus of the pre-aseptic days. Numerous operators, notably Küstner and Latzko, followed his lead and improved his method, but all the operations devised were of great technical difficulty and remained weird and wonderful procedures not to be undertaken by the average surgeon. It remained for Kronig of Freiburg in 1912 to show that a transperitoneal approach to the retrovesical lower uterine segment made a much simpler operation and yielded the same net result. In his original operation the bladder was freed with a triangular flap of loose vesico-uterine peritoneum in the centre and pushed down off the lower uterine segment as in abdominal hysterectomy. The triangular flap was later sutured up over that part of the uterine incision which extended above the bladder area. Beck, in an effort to reduce the mortality from Caesarean section, tried the Krönig operation. The results were encouraging. One case, however, died from the triangular peritoneal flap sloughing loose, sliding down, and allowing sepsis to seep through the exposed upper end of the suture line. He then improved the operation by dividing the vesico-uterine peritoneum transversely well down on its loose uterine attachment and raising an upper flap, to be sutured down later over the upper end of the uterine incision before pulling the bladder well up over all. Twenty-nine operations were performed with this technique, some on potentially infected cases, without a fatality. This modification is now generally adopted.

Opitz has independently described a modification similar to that of Beck which also provides for gauze drainage of the retrovesical space through an opening made in the upper vagina. Owing to the extreme rarity, however, of post-operative retrovesical abscess, which can be easily evacuated by anterior colpotomy, vaginal drainage as a routine procedure is unnecessary. De Lee suggests that the fascia between the uterus and bladder be sutured as a separate layer with the suture line off to one side as an extra seal to the uterine wound. He also warns against attempting this operation in an excessively fat subject, owing to the technical difficulty.

Krönig's transperitoneal cervical Caesarean section (a name there is no reason to change), with a slight improvement by Beck and made safer by the introduction of De Lee's special knife, is now well within the reach of the general surgeon.

Operative Technique

The patient having been catheterized and the catheter left in situ, and an ampoule of ergot having been given, the abdomen is opened with the patient in the Trendelenburg position, as in laparotomy for any pelvic condition. The incision is made in or slightly to one side of the median line and extends from the symphysis to about three centimeters below the umbilicus. The anterior layer of the rectus sheath is divided to the pubic bone to ensure good exposure at the lower angle. The inner flap is raised with forceps while the inner edge of the rectus is separated from it with the handle of the knife and retracted outwards. The peritoneum is opened at the upper angle and the incision carried down by pushing with half opened scissors, curving off to the left of the apex of the bladder, should the latter lie high on the abdominal wall. The bladder now lies flaccid in the pelvis. The loose vesico-uterine peritoneum is located by making it slide with the finger, and incised transversely with a gentle stroke of the knife two centimeters below its firm attachment. This incision should extend five centimeters on each side of the mid-line. The bladder is now pushed well down with a sponge-on-holder. It will be found to separate very easily. The upper flap is loosened by spreading curved Mayo scissors under it at several points. The second assistant now holds the bladder well down with a Deaver retractor and the operator marks the upper and lower limits of the uterine incision with Allis clamps. The upper one is placed as high as possible up under the upper peritoneal flap and the lower one close to the retractor holding down the bladder. Traction sutures may be used if the Allis clamps will not hold. The first assistant's left hand now pulls the uterus up out of the pelvis as far as possible thus giving a better exposure of the lower uterine segment. A hypodermic of pituitrin is now given in the arm or chest. Through a tiny incision in the uterus close to the upper Allis clamp the De Lee knife is inserted, carried down just inside and punched out through the wall again beside the lower

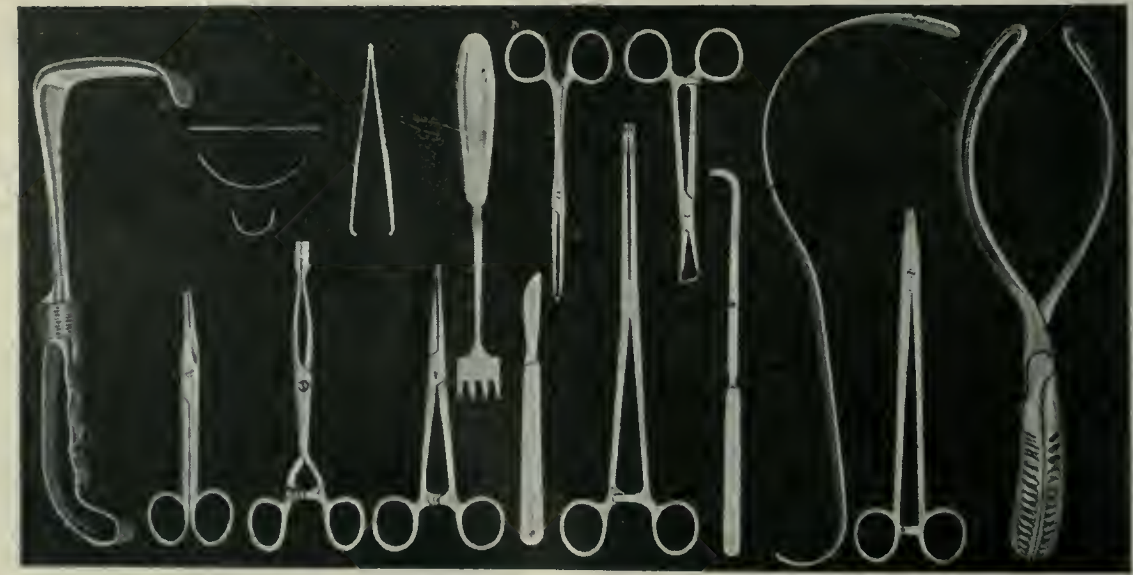

FIG. I.—INSTRUMENTS REQUIRED

Top Row—Keith's abdominal needle 1, full curved large surgeons' needles 3, Mayo catgut needles 4, Deaver's mouse-tooth tissue forceps 2, Volkmann's retractors 4 prong 1 pr., Allis' clamps 2, Backhaus towel clamps 6. *Bottom Row*—Kelly retractors 1 pr., curved Mayo scissors 1 pr., Collin's tongue forceps 6, Rochester-Carmalt clamps 8, scalpels 2, sponge holding forceps 2, De Lee knife 1, Deaver's 2 inch retractor 1, Mayo needle holder 1, and obstetrical forceps. In addition for the deeper pelvic work a long pair of tissue forceps is sometimes useful.

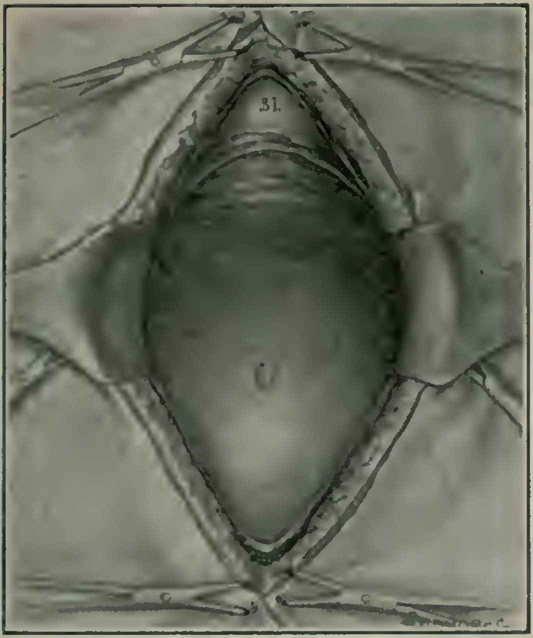

FIG. II.
Showing the abdomen opened below the umbilicus. The loose vesico-uterine peritoneum has been divided transversely two centimeters below its firm attachment to the uterus and the bladder pushed part way down.

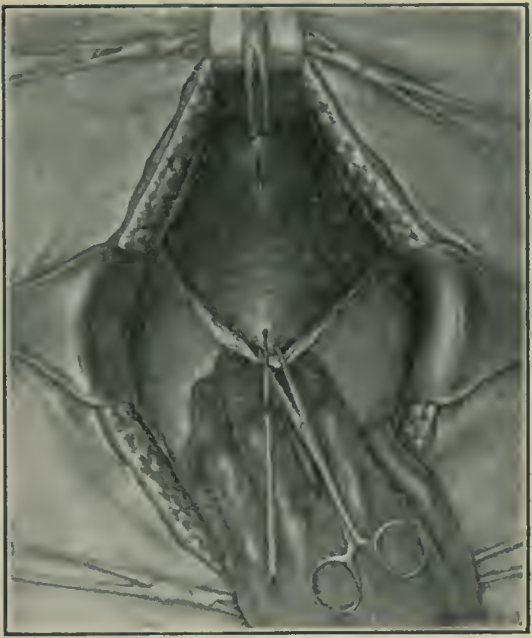

FIG. III.
Showing the De Lee knife laying open the lower uterine segment while the first assistant's left hand pulls the uterus up out of the pelvis.

Allis clamp. It is then drawn up with a fine sawing motion laying open the lower uterine segment.

The face may be pulled into the wound by a finger introduced into the mouth, and if necessary forceps may be applied. In other presentations the feet may be grasped. After the removal of the child if the haemorrhage is severe the edges of the incision should be grasped with tongue forceps while the placenta is removed and the cavity wiped clean with dry gauze.

The uterine wound is readily closed with two layers of continuous No. II chromic gut. The first layer approximates the inner half of the muscular wall, avoiding the decidua, and the second the outer half. Care must be exercised not to mistake thick decidua from which the muscle has retracted for the thin wall of the lower uterine segment. The upper peritoneal flap is then tacked down with three or four interrupted sutures of plain gut, and the lower flap bringing with it the bladder is pulled up by forceps until it overlaps the upper one and is sutured to the peritoneum of the uterus with continuous plain gut.

The uterine incision is now completely sealed off and the only evidence of intra-abdominal interference is the almost invisible suture line along the top of the bladder. The abdomen is closed without drainage, retention sutures of silkworm gut or heavy silk being used.

Illustrative Cases

The following two cases which, previous to our newer knowledge would have run a fearful risk of losing their lives by classical section or have lost their babies by craniotomy, illustrate the possibilities of the new operation.

Case I. (patient of Dr. V. H. Craig)—in labour thirty hours, the last six of which the pains were very severe, membranes ruptured, vaginally examined, no engagement, approaching rupture of uterus feared. Transperitoneal cervical Caesarean section, bled profusely, sterilized, transfused 800 c.c. unaltered blood 24 hrs. after operation. Sapremia with very foul lochia for several days, convalescence otherwise uneventful.

Case 2. (patient of Dr. C. T. Bowles)—Two previous normal deliveries of five pound babies. In labour forty-six hours, membranes ruptured, forceps attempt before admission. No engagement. Transperitoneal cervical Caesarean section under spinal anaesthesia given by Dr. Geldert (patient had influenzal bronchitis), haemorrhage almost nil, baby delivered easily without forceps. There was a sapremia with very foul lochia for several days necessitating the use of vulvar pads soaked in Dakin's solution to keep down the odor. Severe cough persisted for a week with no harm to the wound except a stitch abscess. Baby weighed seven pounds and had forceps marks on its head.

Conclusion

While the teaching of recent years has impressed on us the sacred duty of keeping clear of the parturient vagina except when absolutely necessary and then treating it like the peritoneal cavity, cases will still occur which are potentially infected and cannot be delivered from below. We can now offer such a patient a relatively safe chance of rescuing her baby alive. An operation which will do this must be regarded as one of the greatest developments of modern surgery.

My thanks are due the Canadian Air Board for photographing the instruments, and to Mr. Ivan Summers for the two splendid illustrations drawn from the writer's sketches.

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ACUTE INTESTINAL INTOXICATION IN INFANTS*

An Analysis of Seventy-five Cases Treated in the Hospital for Sick Children, Toronto, During the Summer of 1922†

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Acute intestinal intoxication may be defined as an acute metabolic disturbance with a predominance of gastro-intestinal symptoms, occuring in infants and young children, during the hot weather. It is characterized by its sudden onset, with collapse, vomiting, usually diarrhoea, frequently hyperpnoea, moderate leucocytosis, varying degrees of pyrexia and dehydration.

Etiology.

(1). *Predisposing causes.*—The close relationship between the temperature of the air and the morbidity of this disease is perhaps the most striking feature concerning it. Nearly all the cases are seen in the summer and develop towards the end, or after a protracted hot spell. The mode of action of the heat has not been determined. Its effect has been attributed to direct heat stroke or to its action on the food by causing an increase in the number of organisms and consequent decomposition.

The perusal of the feeding histories of these children brings out two facts, (1) the small number who have been breast fed, and (2) the frequency of change in the feeding. In our series only five infants had been breast fed for any effective length of time, and none of these were breast fed at the onset of the illness. The second observation is important in that it indicates the presence of a previous gastro-intestinal upset. Acute intestinal intoxication is rare in a perfectly healthy baby. Among the artificial feedings, highly refined carbohydrate rich foods are most at fault. The morbidity and mortality are both increased by their use. Rational cow's milk dilutions appear to be best when the nurse fails.

	No. of Cases	*Per cent Mortality*
1.—Rational cow's milk dilutions........	17	50
2.—Patent food (rich in carbohydrates)..	38	74
3.—Cow's milk dilutions (not rational)..	20	56.6

Age.

There is a gradual increase in morbidity up to six months, at which the peak is reached. Following this there is a steady fall, until a slight rise occurs again between eleven and twelve months. There is a steady fall in the percentage mortality, with increasing age.

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*Read at the 1st Annual Meeting of the Canadian Society for the study of Diseases of Children, Montreal, June, 1923.

†Cases of Infectious Diarrhoea, (Dysentery) are not included in this series.

From the Wards and Laboratories of the Hospital for Sick Children and the Department of Pediatrics, University of Toronto.

(2). *Active causes.*—The primary cause of acute intestinal intoxication may be, (1) Production of some toxic substance from the food by decomposition; (2) Improper foods; (3) Infection of the intestinal wall with bacteria; or, (4) Abnormal absorption of catabolites from the bowel. Numerous bacteriological researches have failed to reveal a pathognomonic organism. Mellanby[1] in 1915 suggested the possibility of an amine base, which could readily be formed from histidine, a non-toxic substance, found normally in the bowel. He produced comparable symptoms in animals by injecting the B. amino-adzalethyl-ethylamine into their gastro-intestinal tract. From our experimental work[2] we consider the cause of acute intestinal intoxication to be a circulating toxin, produced in the mucous membrane of the bowel. Chemically the substance resembles closely an amine base, and possibly is the normal toxic substance found by Starling[3] in bowel mucous membrane. Further work is being done to determine whether the symptoms are due to an over production or increased absorption of this substance. Numerous organisms may play a secondary rôle in producing the poison by converting a harmless protein split product from an acid to a toxic basic substance.

Pathology.

There are no characteristic pathological lesions. The commonest, and frequently the only, abnormality seen is a fatty liver. This change was observed in 75 per cent. of our cases in the gross. Microscopically it is almost universally present and is lobular in type. The fatty changes were more marked in the very acute cases.

No pathognomonic changes were seen in the bowel. Cases having a history of previous gastro-intestinal upsets presented a catarrhal enteritis in some instances. Circulatory changes, varying from congestion and petechial haemorrhages, to, in two cases, actual ulceration were seen. These latter changes are those seen in any intoxication caused by proteins, or their split products.

The other organs were normal, unless some complications such as broncho-pneumonia had been present.

Symptoms and Signs.

The onset of the intoxication is sudden. It is usually preceded, or accompanied by diarrhoea. Occasional cases with constipation occur. Convulsions are common. Refusal of food and vomiting are the rule. The temperature is usually 103°–105° F. The facies is characteristic, with staring, sunken eyes, open mouth, and very often muscular twitchings. Leucocytosis is moderate, 10,000–13,000, and could almost be accounted for by the concentration of the blood. Loss of weight is rapid. This is chiefly through salt and water loss by way of the bowels and lungs. The degrees of intoxication and dehydration were the same in most of our cases, and in no case was the intoxication greater than the dehydration, and the reverse was only noted twice. The liver is usually enlarged, and its size furnishes a roug indication of the degree of intoxication present.

Treatment.

Prophylactic treatment affords the most hopeful means of combating this disease. The urgency for breast feeding is indicated by the greater prevalence of the disease among artificially fed. When artificial food must be used, proper dilutions of cow's milk are best. Such mixtures should be boiled to render them more constipating and to destroy bacteria. Overfeeding, with either the breast or an artificial food should be guarded against. Any diarrhoea should be treated promptly. Abundance of fresh air, light clothing and cleanliness should be insisted upon. Abundance of fresh air, light clothing and cleanliness should be insisted upon.

During the summer of 1922, all infants suffering from the disease were put under the care of the authors. A definite plan of treatment (seen below) was drawn up, and infants on admission were placed in turn in the different groups. The only exception to regular rotation was made in cases of infants admitted in a moribund state and from whom we did not feel justified in withholding the benefits of exsanguination transfusion.

Treatment.—(*a*) Starvation period of 12 to 48 hours depending on degree of toxicosis.
Water by mouth—quantities recorded, saline subcutaneously, intraperitoneally and intravenously, followed by 2 per cent. lactic acid milk feeding.

(*b*) *Same starvation period.*
Water by mouth, glucoso 5 per cent. subcutaneously, intra peritoneally and intravenously 2 per cent. lactic acid milk feeding.

(*c*) *Same starvation*—
and fluids as in (a), but protein milk powder feeding.
(*d*) *Same starvation*—
and fluids as in (b), but protein milk powder feeding.
(*e*) *Same starvation*—
but exsanguination transfusion followed by fluids and food as in (c).
(*f*) *Same starvation*—
but exsanguination transfusion followed by fluids as in (d).
(*g*) Same as in (e) and (f) only using 2 per cent. lactic acid as food.

(1) *Dehydration.*

Making up the water loss, which is always present, is the most urgent treatment needed. As much water, or 5 per cent. glucose, as the infant could take was given per os. This amount was often small in amount, due to the infant's refusal to take water, and the frequent vomiting which ingestion of anything by mouth induced. Fluids were therefore given by the interstitial and intravenous routes. Normal saline and 5 per cent. glucose were used. Little difference was noted in the value of these fluids. Intravenous administration produced more immediate improvement, and was used in all cases at first. Interstitials were given two or three times a day, from admission until the child could take sufficient fluid by mouth.

(2) *Toxaemia.*

A means of directly combating an unknown toxin is not easily found. The presence of a circulating toxin, suggests however, the removal of the medium in which it is, and its replacement by another fluid. Removal of the patient's blood, which contained the toxin, followed immediately by transfusion from a suitable donor, suggested itself as a feasible means of doing this. The transfusion would also aid in treating the dehydration, as more blood was usually given than was withdrawn. Early in the summer cases fell into the exsanguination transfusion groups in rotation; later on, the worst cases were all treated in this manner as it afforded their only hope of recovery. As will be seen in the table below, the cases most benefitted by this procedure were those generally considered hopeless. The mild cases did just about as well when their dehydration was treated by saline or glucose only. The most striking benefits from exsanguination transfusion were seen in those very acute cases in which there was a sudden and rapid development of the symptoms.

Exsanguination Transfusion in Intestinal Intoxication.

(1) Moribund on admission.
11 cases — 9 deaths
Mortality 81.8 per cent.

	Cases	*Deaths*	*Mortality*
Without exsanguination transfusion	6	5	83.3
With " "	5	4	80.

(2) In poor condition on admission.
38 cases — 20 deaths
Mortality 52.8 per cent.

	Cases	*Deaths*	*Mortality*
Without exsanguination transfusion	15	11	73.3
With " "	23	9	39

(3) In fair condition on admission.
25 cases — 12 deaths
Mortality 48 per cent.

	Cases	*Deaths*	*Mortality*
Without exsanguination transfusion	16	8	50
With " "	9	4	44.4

(3) An initial period of starvation, its length varying with the condition of the child, was instituted in all cases. Following this, dilutions of protein milk or 2 per cent. lactic acid milk were given. The protein milk was usually made from the powdered protein milk, but in certain protracted cases, the substitution of liquid protein hastened the cure. The stools become normal a little sooner on the protein milk, either liquid or powder, than on the lactic acid milk. The average time taken to effect this change was 29.5 days in the former and 32.4 in the latter, the minimum time with the protein milk powder was five days, and with 2 per cent. lactic acid milk 14 days. Formed stools were obtained sooner with liquid protein than with the powder. No difference was observed in the amounts of these foods the child would take or in their influence on vomiting or other symptoms. As the stools improved the child was placed on higher concentrations of these foods or on a boiled 2 per cent. milk mixture. Carbohydrates were added gradually. Dextri-maltose is apparently the best of the sugars.

(4) *Medicinal.*

Medicines are of little use in the treatment of this disease, aside from stimulants during the collapsed stage. Chalk mixtures were tried in a few cases without appreciable results.

The following table shows the effect of the different treatment groups on the mortality,

	Per Cent Mortality	
A.—(Saline 2% L.A.M.)	100	(1 case)
B.—(5% Gluc. 2% L.A.M.)	50	
C.—(Saline P.M.P.M.)	33	
D.—(Glucose P.M.P.M.)	74	
E.—(Saline P.M.P.M. Ex. Trans.)	25	
F.—(5% Gluc. P.M.P.M. Ex. Trans.)	41.6	
G.—(Saline or 5% Gluc. L.A.M. Ex. Trans.)	53	

P.M.P.M. = Protein milk powder mixture.

CONCLUSIONS·

1.—Heat is effective in the causation of the disease.

2.—There is a toxin, probably an amine base, produced in the bowel which circulates in the blood, and is capable of producing all the symptoms of the disease.

3.—The only constant pathological finding is the fatty degeneration of the liver. Circulatory changes, such as are caused by injection of foreign protein, are fairly common in the mucosa of the small bowel.

4.—Breast fed infants are in the minority of those affected.

5.—Highly refined, carbohydrate rich foods are the foods used in the majority of cases.

6.—Gastro-intestinal derangements, however mild, are noted in the histories of most cases.

7.—It is of paramount importance to make up the fluid losses by interstitial and intravenous therapy. There is little to choose between normal saline and 5% glucose for this purpose.

8.—Exsanguination transfusion offers the most successful means of combating the toxin particularly where there is a sudden and profound toxaemia. It should be tried, no matter how hopeless the case appears.

9.—During the acute stage, the food should be fat and carbohydrate poor. Such feedings are protein milk and 2 per cent. lactic acid milk.

10.—Medicines are of little use.

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ACUTE INTESTINAL INTOXICATION

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ACUTE intestinal intoxication, which is so prevalent in our cities during the hot summer months, has as we all know, a very high death rate. At the Hospital for sick Children, Toronto, during the year 1920, the mortality in this condition was 58 per cent.; during the following year, 1921, the mortality was still above 50 per cent. and this in spite of the best known methods of treatment[1].

In the face of this it must appear obvious that if we are to reduce the mortality in acute intestinal intoxication, the condition itself must be better understood, especially by the man in general practice, who usually sees these cases first, in order that we may recognize the condition during the very early stages, and secondly, that we may understand the proper treatment of the condition which, after all, at this stage is very simple.

That the diagnosis of intestinal intoxication presents certain difficulties we are forced to admit, so in this paper I will deal only with the clinical aspect of acute intestinal intoxication in infancy and early childhood, a condition also referred to as toxicosis, alimentary intoxication, food intoxication, summer diarrhoea, cholera infantum, ileocolitis, and there are still other terms used to designate practically the same symptom complex, as that found in intestinal intoxication.

This condition which is always preceded, if only for a short time, by some nutritional disorder, is one of profound toxaemia of intestinal origin, and of course means a severe disturbance of metabolism.

Diagnosis.—In cases of severe intestinal intoxication the nervous symptoms present, viz., the twitching of the muscles of the face and hands and arms, with a rigid neck and sometimes convulsions along with the profound toxic appearance of the patient, have caused many a case to be diagnosed as one of meningitis, and as a result proper treatment has not been started (one of the factors in our high mortality).

A careful investigation of the subjective history of the case with particular attention to the feeding history and any account of previous gastro-intestinal disturbances, along with a depressed fontanelle, enlarged liver, and the general condition of dehydration of the tissues, will assist one greatly in making a correct diagnosis. If doubt still exists lumbar puncture, with examination of the spinal fluid, will rule out the presence of meningitis. The clinical picture of an acute intestinal intoxication resembles also that met with in an acute pyelitis. But here the microscopic examination of the urine will prevent a mistaken diagnosis.

Symptomatology.—The condition is characterized by a sudden onset, vomiting, loose watery stools, at first yellow in colour, then yellowish-green, and later on simply large green watery stains. The stools which contain a good deal of mucus with undigested milk, chiefly fat curds, are invariably acid in reaction, and have a sour odor. The infant expels a good deal of gas, and apparently has considerable colicky pain before passing a stool. There is a rapid loss of weight and a steady rise of temperature, which may within a very short time reach 104° or 105°. The vomiting is generally present at the onset, but does not continue throughout. In the majority of cases a diarrhoea is present, but at the same time it is possible to have an acute intestinal intoxication without a severe diarrhoea.

The facies is very typical in this condition. The eyes have a sunken appearance, and are rolled up, the mouth is open and the lips are dry. The skin is ashen in colour and dry and loose and has lost its elasticity, giving one the impression of a sudden loss of body fluids. The fontanelle is depressed, the extremities are cold, often the thirst is intense. If the condition progresses, within a very few hours there will be extreme prostration, deep, rapid, but pauseless breathing without cyanosis; occasionally there is Cheyne-Stokes respiration and this disturbance of respiration is due to the condition of acidosis present. The appearance of convulsions with oncoming stupor and coma is generally followed in a few hours by death as the result of an overwhelming toxaemia.

A few words on the *etiology* of this condition may now be given and firstly the *predisposing causes* will be considered. It is much more prevalent during the summer months and in artificially fed infants during the first year of life. Those infants fed upon proprietary foods, high in carbohydrate content, are especially prone to this condition. It is possible to find this condition in breast fed infants, but is not often met with. When it is, it is not as severe and the prognosis is better than in artificially fed infants. Previous alimentary disturbances and the presence of rickets are very important predisposing factors. The action of heat is not clearly understood, but it appears to have an important bearing upon this condition. It may be by its action upon milk, increasing the number of bacteria present, or it may be the direct effect of heat upon the infant's body, a form probably of heat intoxication, which reduces the infant's resistance.

The active causes.—There are numerous theories put forth as to the cause of this condition. Four of these appear to have many exponents. (1) Some element of the food, generally looked upon as the sugar. (2) Decomposition of the food. (3) Bacterial infection. (4) Dehydration theory.

(1) It is the opinion of Finkelstein and Meyer[2] that sugar intoxication accounts for a large proportion of our cases of acute intestinal intoxication. They have proved conclusively that milk sugar, also cane and grape sugars, will produce of themselves intoxication, and it appears to be a clinical fact that a high fat content of food aids in the production of the intoxication, and we know that the withdrawal of sugar hastens recovery.

(2) Czerny and Keller[3] describe a symptom complex, identical with acute intestinal intoxication, which they call toxicosis. It is their belief that the condition is due to the decomposition of food by bacteria; as a result we have the incomplete splitting of fats and the absorption of these products which causes a derangement of metabolism.

(3) Bacterial infection of the intestinal canal. Many workers have put forth this theory, but I believe to-day it is only looked upon as playing a part in that type of intox-

ication associated with a true infectious diarrhoea.

(4) Dehydration theory. As the result of the dehydration and ultimate lack of water in the tissues, oxidation processes are impaired and it is quite probable that poisonous derivatives of body protein katabolism carry on the toxic condition. This theory is supported by the fact that detoxication always occurs as soon as water retention is established. In the recent translation of Feer's *Paediatrics*[4] he deals with this theory.

Howland and Marriott[5] have proved beyond a doubt that during the acute stages of an intestinal intoxication a very severe acidosis exists. This coupled with the great loss of body fluids containing salts, along with a deficiency in the sugar handling properties of the patient, indicates a severe disturbance of metabolism. These factors give us valuable hints as to the line of treatment to be adopted.

Course and prognosis.—Evidently there are many degrees of severity of this disease. There are cases on record where death has taken place within 24 hours of the time of onset of the first symptoms. Such cases are usually in very young infants. In older children two and three years of age the intoxication is generally of a much milder type.

Probably the greatest factor in a favorable prognosis is the promptness with which proper treatment is instituted.

A persistent high temperature with continuous vomiting and stupor, with progressive enlargement of the liver lead one to an unfavourable prognosis. The steady fall in the weight curve is also a bad prognostic sign, but when the weight curve becomes horizontal, it means that water retention has been established, and with this the toxic condition clears and the outlook becomes much more favourable.

Infants suffering from this condition are naturally in a state of very much lowered resistance, and as a result are very susceptible to any infection, such as nasopharyngitis, otitis media, broncho-pneumonia, etc., and any of these complications make the prognosis all the more grave. Age and previous intestinal disturbances play a very prominent part in prognosis. During the first six months the mortality is extremely high. Marasmus is the common sequela of acute intestinal intoxication and it is followed by a long reparative stage. The management and feeding of these cases are subjects in themselves.

The treatment and management of cases of acute intestinal intoxication may now be taken up.

Preventive measures.—Make sure the milk supply is fresh and has been pasteurized before feeding to the infant, and that cleanliness is exercised in handling it. See to it that plenty of cold boiled water is offered to the infant during the hot summer months. All unnecessary clothing should be removed and this includes especially the flannel binder. The maximum amount of fresh air should be provided, keeping the infant outside as much as possible. Reduce the amount of sugar in the formula to a minimum and if at all possible never wean an infant during the summer months. By following closely these suggestions you are simply "playing safe."

At the first sign of an intestinal intoxication *three indications stand out as all important.* (1) Do not administer a cathartic at the onset of diarrhoea, as it is perfectly evident that the bowel is already doing its best to rid itself of any noxious substance present and a cathartic will only increase the danger. (2) Stop all food. (3) Supply plenty of water.

In those cases of acute intestinal intoxication of but a few hours duration that I have seen, it is unusual for the temperature to remain high when the patient has been put upon starvation diet and plenty of water administered. If it should remain high see if there is not some complicating cause such as an upper-respiratory infection, and here let me emphasize the importance of taking extra care to prevent the infant from being exposed to any infection.

If the case is one of very mild intestinal intoxication and responds well to starvation diet and fluid treatment, it may be treated at home. All other cases should be admitted to hospital.

The starvation diet should be continued for 24 hours at least and during that time as much water as possible administered by mouth and if necessary subcutaneously in the form of a 5 per cent. glucose solution or normal saline. If temperature is not down and there are evident signs of intoxication still present, the starvation period should be lengthened to 48 hours and it is occasionally necessary to continue it for 72 hours especially if vomiting tends to persist. If it should be necessary to continue the starvation period into the third day, it is advisable to administer stimulants, camphor and oil hypodermically, and whiskey or brandy, at the same time administering fluids in the form of glucose solution or normal saline either subcutaneously, intraperitoneally, or intravenously. If the infant is under six months of age 150 to 200 ccs. interstitially. If from six to twelve months 200 to 300 ccs. interstitially and repeat every 8 or 12 hours as appears necessary.

If, when the patient is first seen, intoxication is pronounced and the tissues are much dehydrated, the infant should be admitted to hospital and 5 per cent. glucose solution or normal saline solution should be given intravenously, into the longitudinal sinus, (using a guarded needle). From 13 to 15 ccs. per pound of the infant's body weight should be administered and an interstitial injection as well. This is a perfectly safe procedure as the circulation will only take up the fluids from the tissues as it can handle it.

In cases of severe intestinal intoxication, exsanguination followed by blood transfusion, the technique of which is described by Robertson *et al*[6]. should be done at once and offers practically the only hope of recovery. Even with this the mortality in this type of case is extremely high. These patients should also be given fluids interstitially within 8 to 12 hours and this procedure repeated as often as appears necessary, in other words, until water retention is established when the weight curve will become horizontal.

When feeding is commenced at the end of 24 or 48 hours, start in with one-half strength powdered protein milk sweetened with saccharine and keep the infant upon this feeding until all signs of intoxication have disappeared and the child is having a normal stool, before adding any sugar to the feeding.

Now in going over this treatment which I have just outlined there are three outstanding features. Two negatives and one positive, as follows:

(1) No mention has been made of the use of sodium bicarbonate in treating the condition of acidosis present, for equally good, if not better, results have been obtained by the use of glucose solution and it can be given interstitially or intraperitoneally, while one would hesitate to use sodium bicarbonate interstitially as it is sometimes followed by sloughing. Added to this objection is the difficulty in preparing a sterile solution of sodium bicarbonate. The glucose appears to act as fuel for the increased H-ion concentration of the blood stream, and in the end practically the same result is obtained.

(2) No drugs are necessary or advisable in the treatment of either the diarrhoea or the vomiting, or of the toxic condition itself.

(3) The all important part water plays in the treatment of this condition. As soon as water retention is established in the body, detoxication occurs, and the prognosis improves.

Summary.—In this paper I have merely hoped to point out the importance of an early diagnosis for in this lies our only hope of reducing the mortality of acute intestinal intoxication at the present time, until the etiology of the condition is more clearly understood. I have also hoped to point out the simplicity of the treatment during the early stages and, as an aid to an early diagnosis, let me emphasize the importance of investigating thoroughly the feeding history and of obtaining an accurate account of the present gastro-intestinal condition, and along with this certain positive findings upon physical examination, the slightly depressed fontanelle, the enlarged liver, the typical facies, and, a little later on, the dehydrated tissues.

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CHRONIC SINUSITIS IN CHILDREN

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THE problems of accessory sinusitis in adults have received much attention for a long time now. It is only in recent years that the importance of similar conditions in children has been emphasized. Acute accessory sinusitis with its more obvious and urgent symptoms is usually recognized, but it is the chronic case with much more obscure symptoms that is liable to remain undiagnosed. An investigation, the results and conclusions of which form the basis for this short paper, was undertaken at the Hospital for sick Children, Toronto, during the year 1921-22. Some eighty cases were studied, being the number culled from about 2000 patients attending the special clinic during that time. The ages of the cases varied from five to thirteen years. Before the fifth year localization in any one of the sinuses does not usually take place, although acute ethmoiditis is occasionally seen in even younger children. Because of the small size of the cavities in children under five years, the mucosa of the nose and sinuses probably shares as a whole in any infection. For all practical purposes the nose may be considered the pathway of infection . Theoretically, the blood stream might act in this capacity. The teeth are rarely at fault, even in older children.

Before proceeding further a word or so as to the development of the accessory sinuses might be advisable. Authorities seem to differ on this subject, but as a general rule the sphenoidal sinus only attains an appreciable size at the age of five years, *i.e.*, about the size of a pea. The ethmoidal cells are present before birth and are fairly well developed even in the infant. The maxillary sinuses are well developed at birth, and at the age of five years are usually as large as a hazelnut or larger. The greatest irregularity in development occurs in the frontal sinus. It may be well developed at the eighth year but it is much more usual to find little development of importance until the 10th or even the 12th year It would appear that the ethmoidal sinuses are most commonly affected, but it is not uncommon for the maxillary sinus to be infected too. Maxillary sinusitis *per se* does occur but it is often associated with ethmoiditis.

Infection of the frontal and sphenoidal sinuses is much less common. Not one case of those examined aroused suspicions of sphenoidal infection symptomatically, rhinoscopically or radiologically. That it does occur not infrequently has been demonstrated by other observers. Only one case of chronic frontal sinusitis occurred in the series—a girl of thirteen with associated bilateral chronic ethmoiditis.

What would lead one to suspect the presence of chronic sinusitis? To summarize briefly the following signs and symptoms:—(1) Nasal discharge—especially if unilateral and the presence of a foreign body has been excluded. (2) Constant headaches. (3) Pains in the face and teeth. (4) Constant colds or sore throats. (5) Catarrhal deafness. (6) Cervical gland enlargement. (7) Epistaxis. (8) Mental hebetude. (9) Excoriation and redness of anterior nares of long standing. (10) Pallor and dullness of expression. (11) Arthritic pains. (12) Systematic infection due to local disease. In fact, the symptoms are very similar to those associated with enlarged or septic tonsils and adenoids. It is this similarity of symptoms that often leads to secondary and even further operation for the removal of adenoids and tonsils. The proven cases in our short series seemed to group themselves into one of the following classes: (1) Sinusitis associated with enlarged or septic tonsils or adenoids. (2) Sinusitis persisting after removal of tonsils and adenoids without apparent cause. (3)Sinusitis associated with nasal deformities or hypertrophies. (4) Sinusitis due to other causes.

Methods of diagnosis.

(1) Consideration of the history of the case. (2) Anterior and posterior rhinoscopy. (3)

X-ray photograph of skull. (4) Intranasal exploration of the antrum and sphenoid sinus and lavage. Having made a careful study of the history of the case, the mucosa of the nose is well shrunken with cocaine-adrenalin solution (5% in 1-1000). Any departure of the mid turbinate bone from the normal, *i.e.* in the appearance of its covering mucosa associated or not with polypi is indicative of ethmoiditis. Pus coming from the middle meatus is diagnostic of suppuration in one or all of the anterior group of sinuses, *viz.* the anterior ethmoids, frontal or maxillary sinuses. On posterior rhinoscopy the presence of pus especially if coming from one side of the nose is very suspicious of sinusitis. Dried secretion on the vault of the naso-pharynx after the removal of adenoids is suspicious of sphenoidal infection. Hypertrophy of the lateral pharyngeal lymphoid masses, in the absence of adenoid tissue is very suggestive of sinusitis.

Transillumination in young children does not seem very dependable, possibly because of the small cavities and thick walls of the antra. In older children it has some value in helping to corroborate other evidence. X-ray photographs were found useful in demonstrating the presence of the sinuses, their shape, size and position. Density shadows are rather unreliable and can only be used in conjunction with clinical findings. In the stress of a heavy clinic it is very convenient to have suspicious cases x-rayed before further investigation.

Absolute diagnosis of infection in the sphenoid or maxillary sinus can only be made by washing out the sinus and examining the return flow. Briefly, the technique for proof puncture of the antrum is as follows:—(1) Nose flushed clear of all secretions with normal saline solution. (2) Anaesthesia: under eight years ethyl chloride after local anaesthesia; over eight years local anaesthesia. (3) A fine straight trocar and cannula is driven into the antrum through the inferior meatus and trocar withdrawn. (4) Syringe attached to cannula and three or four c.c. of normal saline blown into the antrum and withdrawn for bacteriological examination. (5) Sinus flushed until return flow is clear. The character of the contents of an infected antrum varies from mucus to old foul pus. The bacteriological results were very varied, the majority of cases yielding more than one organism. From two of the cases pure cultures of B. influenza were obtained. The most frequent organism observed was the haemolytic streptococcus. No instance of K.L. bacillus was noted. Apparently any and almost every organism may be found, but it seems to be difficult to find the causative organism. It is not usual for the organisms present to influence the treatment to any extent.

Fortunately, in children the condition yields much more readily to treatment than in adults. The treatment consists in the application of the two principles of nasal surgery, *viz.* drainage and ventilation. The vast majority of cases where the tonsils and adenoids are at fault clear up quickly when these structures are removed. The exceptional case which does persist yields as a rule to simple lavage, repeated if necessary.

Intra-nasal deformities and hypertrophies which are interfering with drainage and ventilation of the sinuses should be corrected or removed. Two cases of maxillary sinusitis very quickly cleared up when a high deflection of the septum was corrected. Polypi when causing trouble should be removed. The ethmoidal cells may be drained by removing the anterior end of the middle turbinate and gently curetting away the inner cell walls.

Extensive intra-nasal operations in children are contraindicated. Very occasionally it is necessary to open the antrum through the nose. To illustrate this the following case is cited:—H. H., Age 10; complaint—purulent right sided nasal discharge which has persisted for eighteen months. History of right combined intra and extra-nasal antrum operation fourteen months ago; tonsils and adenoides removed in infancy. On examination the right passage of the nose was filled with a white muco-purulent cast. The septum was markedly bowed to the left side, obliterating the left passage. The turbinate bones on the right side were very small and there was a large opening under the inferior turbinate leading into a shallow antrum cavity.

Dec. 12/22.—Submucous resection. Septum returned to middle line creating a left passage and cutting down size of right passage by half. This enabled the child to blow its nose properly and get rid of secretions; also to use a cleansing lotion. When seen six weeks later there was no complaint of nasal discharge. The nose was clear and no treatment necessary.

This case would suggest that over-ventilation may be conducive to collection of discharges in the nose. Such a condition of things is seen in cases of atrophic rhinitis. Whether the sinus infection, when present in cases of atrophic rhinitis, is the cause or effect of the nasal condition is not known.

Three such cases were noted. Here the results of treatment are disappointing: all that seems feasible by way of treatment is regular cleansing of the nose and maxillary sinuses. No operative procedure is advisable, especially the removal of adenoids. Cases of sinusitis have been reported as due to syphilis or tuberculosis, but it is difficult to say if the general disease is the actual cause or merely favours infection of the sinuses. Conversely, local infection is well known to be the cause of systemic infections. In adults the relationship to systemic infections is very commonly seen, probably the greater difficulty in diagnosis accounts for this relationship in children being so rarely established. But that such a relationship does exist is none the less certain.

There are many difficulties in the investigation of the sinuses in children: considerable time and patience is required. It was found necessary in some cases to admit the patient to hospital so that the work could be carried out at leisure.

For this reason alone it would seem that many cases go undiagnosed, and what is thought to be an uncommon condition is in reality relatively common. In closing, I wish to take this opportunity of thanking my colleagues in this work, especially Dr. E. Boyd, chief of service, for excellent advice and sympathetic co-operation.

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Sir William Dalby Memorial Prize.—Lady Dalby has recently handed to the Royal Society of Medicine the sum of £500 to be invested for the purpose of providing a perpetual memorial of her husband, the late Sir William Dalby, who was a well known otologist in London. The trust deed provides that the interest on the capital sum is to be accumulated for five years, when the product, less expenses, is to be awarded as a prize to the person who, during the previous five years, has produced the best original work done or published for the advancement of otology. The prize will be awarded by the Council of the Royal Society of Medicine upon the recommendation of the President and Vice-Presidents of the Section of Otology. The Society has one other similar fund, founded in memory of Dr. R. T. Nichols; under it the proceeds of a sum of £2,200 is awarded in recognition of the most valuable contribution to the prevention of puerperal septicaemia. It has also a Gibson Scholarship to assist medical women in research work. The Society not long ago received a bequest of £500 for an annual Lloyd Roberts lecture. It values very highly certain bequests and gifts it has received for its building and library. Thus its largest lecture room, the Robert Barnes Hall, was founded with a sum of £4,000 to commemorate Dr. Robert Barnes, a famous obstetrician in his day; and the Marcus Beck Laboratory, founded in memory of that beloved surgical teacher; it has also the Marshall Hall Room, by which the library facilities are improved, the Chalmers room, in which the library of the late Dr. A. J. Chalmers is housed, and a library room inscribed to Sir William Allchin. It has also two committee rooms, one to the memory of Henry Louis Florence, and the other to Joseph Toynbee; and finally the Frederick J. Gant bequest of £500 for the purchase of books to enlarge the Gant Library. The charters and by-laws provide that even in the event of the present building being destroyed or given up the name commemorated shall be preserved in any new building by the appropriation to it of a similar room.—*Brit. Med. Jour.*, July 28, 1923.

HEART DISEASE IN CHILDREN*

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In taking up so large a subject as heart disease in children one can necessarily only give a few of what he considers salient points in the time allotted at this meeting. I first desire to draw your attention to a few points about congenital cardiac malformations because I have a strong feeling from personal experience that this condition is frequently overlooked and that often the points of distinction between it and acquired lesions is not sufficiently understood. When I draw your attention to the fact that 12.9% of the cases attending our cardiac clinic at the Hospital for Sick Children, Toronto, are diagnosed as congenital morbis cordis you will realize how important it is for the medical man to be thoroughly conversant with the signs and symptoms of this condition.

I do not propose to dwell upon the maze of lesions which may exist combined or separately, because having diagnosed a cardiac condition as a congenital lesion it is frequently impossible to do more than guess at what the lesion is before death. So many of us, however, have been accustomed to associating congenital cardiac malformations -only with the so-called blue baby, marked cyanosis, or clubbing of the fingers that when we discover a murmur on examination of a heart and some or all of these signs are not present, the possibility of the lesion being a congenital one does not always enter one's mind. Just here I should like to point out that cyanosis and clubbing which usually go together, occur only in about one-third of the cases of congenital cardiac malformations.

Regarding the symptoms, cyanosis is of course one of the most striking when it occurs. Clubbing of the fingers is usually proportional to the cyanosis. Shortness of breath is frequently noticeable especially on exertion. Polycythaemia occurs in the cases having cyanosis. Interference with nutrition as would be expected is commonly present.

The age incidence is a most important factor. It should be remembered that rheumatic heart disease is practically unknown under two years of age and is very uncommon under three. Practically always a bruit heard in infancy means a congenital lesion. Frequently one gets a history from the mother that she was told of a heart murmur at an early age which suggests at once the diagnosis.

In the physical signs of congenital cardiac malformations we have a definite means of distinguishing it from acquired heart disease. It is all important to locate carefully the point of maximum intensity of the bruit. A systolic bruit is heard on listening at the apex in a child of perhaps seven or eight years of age, and we are so accustomed to associating a bruit in this position with mitral disease that without more than a perfunctory auscultation of the heart the case is labelled mitral regurgitation. Had we listened more carefully we would have found that the bruit was loudest over the 4th intercostal space close to the sternum or perhaps in the 2nd or 3rd left intercostal spaces close to the sternum. A systolic bruit heard best in either of these positions is almost always either functional or due to congenital heart disease. It is not due to an acquired endocarditis which in children is practically always due to rheumatism and affects the left side of the heart. Congenital lesions almost always occur on the right side or at the base of the heart. This is the most distinguishing feature of the bruit of congenital heart disease that even though it be well heard over the entire praecordium it is heard loudest in a position in which it would be quite unusual for the bruit of rheumatic endocarditis to have its point of maximum intensity. The bruit is usually harsh, but it may be so soft as only to be heard on careful auscultation.

One point which nearly always impresses one in the examination of these cases is that the left border of the heart is not beyond the nipple line nearly so far as it would be in an acquired condition having similar auscultatory findings. The right border will, however, be out beyond the normal.

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The thrill of congenital heart disease is only characteristic in so far as it occurs with its maximum intensity at a point which would be unusual in acquired endocarditis. With ordinary mitral disease the thrill is usually very limited at the apex; with aortic disease in children there is rarely any thrill and when present it is usually only felt in the 2nd or 3rd space. When a systolic thrill is felt in the epigastric angle or over the pulmonary area it would accord best with a congenital affection.

The presence of other congenital malformations would also, of course, be suggestive. If these points are remembered I think it will only be a very exceptional case which will puzzle you in diagnosis between congenital and acquired lesions.

Regarding the functional murmurs of childhood, we will merely mention them. Almost without exception they do not occur in infancy. The pulmonary systolic murmur is so frequent in healthy children that one might almost go the length of saying that an accentuated 2nd sound and a systolic murmur in this area are physiological in early life. It is differentiated from the congenital lesion by the fact that there are no symptoms, that the latter is rougher, of longer duration and that with it there is usually enlargement of the right ventricle and weakening of the 2nd pulmonic sound. An extra cardiac murmur is also fairly common. There is a third and quite large class of functional murmurs which are common in children and are often mistaken for endocarditis. It is necessary to remember that the heart is an organ formed to regulate the blood supply to the tissues and with a self protective organism to regulate any overstrain. The valves are not only a means of directing the onward current of the blood by preventing a reflux, but also serve to relieve any over-distension of a ventricle by allowing a certain amount of reflux. In certain forms of debility of the heart muscle this reflux may take place at the mitral orifice and a systolic murmur results. This murmur is frequently loudest midway between the left border of the sternum and the apex. Some children will invariably be found to develop a murmur on active exercise which disappears after rest. Also it is well known that children are liable to develop a systolic murmur during the course of, or for some time after, any acute debilitating illness such as a specific fever. This disappears during convalescence.

Coming now to the last and most important class of heart disease in children, *i.e.*, acquired heart disease which is practically always due to rheumatism or chorea, we find it much more common after the age of four years. As pointed out earlier it is almost unknown under two and very rare under three years of age.

Rheumatism in children manifests itself very differently in different years. I personally think it probable that when the bacteriology of this disease is thoroughly worked out that we will find several strains or groups of the infection. Certainly in some seasons the infection is much more virulent than in others. During the winter of 1919 and 1920 in England they had a particularly virulent epidemic in which I saw a good many children brought into hospital with such a virulent carditis that they died with this first attack. Dr. Robert Hutchison informed me that he remembered a similar epidemic ten years previously, but that although usually a disease of the hospital classes, this year, 1919-1920, was the first year it had attacked his private patients. Again although for some peculiar reason rheumatic nodules are not so common in this country as in England, last year we had eight cases with undoubted rheumatic nodules in the wards of the Hospital for Sick Children in Toronto, whereas to date this year I have not seen a single case. Also pericarditis with consolidation of the lower lobe of the left lung was common in the wards of the hospital during 1921 and 1922, whereas this last year we have had practically no cases. This latter may be due to the fact that the infection is not so virulent, because, although it is difficult to prove, I feel certain that this complication is a direct extension pneumonia from the pericarditis and due to the rheumatic infection.

To repeat, rheumatism in children manifests itself very differently in different years, but fortunately for us and our treatment the first attack except in those years in which the epidemic is very virulent, does not as a rule with proper treatment, cause such serious damage that the heart with its marked recuperative powers cannot recover so that the patient may lead a normal, or at least comparatively comfortable, existence. In the ordinary years it is the second, third and later attacks added on top of a heart already damaged by a previous attack which carries the young life off or leaves the individual a cripple for life. It is here in the rôle of preventive medicine that up to the present we find our best index for treatment. You have all experienced the feeling of helplessness which one has when you have a child with a severe carditis and a failng heart in possibly its third or fourth and probably fatal rheumatic reinfection. If we can prevent the child reaching this condition it seems so far our only satisfactory treatment. I have been labouring through the histories of all the rheumatism, chorea, endocarditis and pericarditis cases of the Hospital for Sick Children in Toronto which have been admitted during the past five years. It is difficult to arrive at accurate statistics because so many of these cases have been lost trace of since.

In reviewing 217 cases which were admitted, I found 56 cases re-admitted with re-infected hearts, and many of these had had as many as four or five re-admissions, some having a re-infection every year or oftener. In many of these cases one notices in my lists the comment "no re-infection since tags removed or tonsils and adenoids removed two or three years ago." Of over one hundred cases coming to the cardiac clinic during the past two years we have had four in which chorea has recurred following the complete removal of all foci of infection so far as we could find them; one case in which chorea and rheumatic pains recurred, and three cases in which rheumatic pains recurred. In none of these eight cases did we think they had a reinfection of the heart. We had one other case with an old adhesive pericarditis and a tremendously damaged heart who had been doing unbelievably well. Her exercise tolerance had been gradually worked up and she was looking robust and strong. Her mother broke her leg, leaving the work of a large family and invalid father and mother on her shoulders. She was admitted to hospital with a failing heart, broken compensation and died. Now in children, I think that most of these attacks of broken compensation in a previously badly damaged heart have with them a re-infection, and although all the foci had been cleanly removed so far as we could see, I think that this case was no exception. So that although at present we cannot say that having removed the focus of infection there is no danger of a re-infection, still our experience during the past two years as compared to previous years, when they were not so vigilant regarding complete removal of the faucial tonsils, has been so striking that it would certainly appear that this is a decided step in preventive medicine, and should be carried out as a routine in all cases in children having had symptoms pointing to chorea or rheumatism. We had a good many cases in the clinic at first with the tonsils supposedly removed, but on examination one found tags of faucial tonsillar tissue remaining. We have insisted that all these cases be cleaned up, and I should like to stress that point. We are not forgetting that the past two years have not been years in which rheumatism and chorea have been particularly virulent and that one's conclusions must be somewhat tempered by that knowledge, also we consider that there has been a good deal of luck in the comparatively few cases who have had recurrences of chorea because we believe, as does Lawrence of New York, that chorea is more apt to recur even after the removal of all the foci of infection so far as they can be found, than is the case when the infection manifests itself as rheumatism. However, with improved hygienic surroundings, which by the way I have not taken the time to discuss, and attention paid to the complete removal of all foci of infection in children, one has reason for hoping that we will be able to cut down very materially the incidence of heart disease which has replaced tuberculosis as the cause of the largest number of deaths all the year round in cities and country, and which has been estimated as the cause of one out of every fifteen deaths in North America.

CLINICAL AND BIO-CHEMICAL STUDY OF A CASE OF MUSCULAR WEAKNESS IN AN INFANT

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I. E. G. was born on Dec. 15th, 1921. The first named physician was called in to see this boy on Aug. 4th, 1922; the complaint stated by the parents being muscular weakness and retention of urine.

Patient's History.—The child had been vigorous in its movements in utero, and was born at full term by normal delivery, the mother being ill only about one hour. The birth weight was nine lbs., (as compared with 9.5 lbs. when first seen). The child had eczema in the first two months. The mother thinks that the child had not always been weak, but that the trouble was first noticed by her about the third month. He cut his first tooth at five months. He never had any convulsions, snuffles, mucous patches, glandular enlargement, nor enlargement of liver. When first seen, the spleen was not palpable, and there were no rhagades. There is no history of exposure to tuberculosis, and the parents are not tuberculous. This is the first child of healthy parents and there have been no miscarriages.

The mother stated that at three months of age the baby began to fail and lose weight, and seemed unable to pass urine in normal amounts, only urinating occasionally, and sometimes missing a day altogether. There was no history of indigestion, diarrhoea, bad stools, vomiting, nor anything that would lead one to believe that the child had any error of digestion.

Condition when first examined.—The child had been breast fed. Its abdomen was flaccid, and its bladder was empty. Catheterisation had not been used. The child was not in pain. Nursings were very short, consisting of only a few light tugs at the breast. The child seemed too weak to draw the milk, as there was an abundance in the mother's breasts. The inability to urinate seemed to be from lack of sufficient fluid intake, for the child only took water in very small quantities. For the same reason the child was constipated and the stools were of the small dark meconium starvation type; for this same reason the child lost weight.

On examination the child seemed absolutely listless, and his first appearance was one that suggested marked idiocy, which with the history already outlined made one think of amaurotic family idiocy. However, there was no Hebrew blood in either parent, and an eyegrounds examination did not give the cherry red spot at the macula, so that this diagnosis was discarded. He was so weak that he appeared blind, deaf, and his limbs paralytic (flaccid in type). The face had suffered the least in the disease and starvation. The child did not appear like a case of malnutrition, for his face was round and plump, and had not the pallor of atrophy. The limbs were not well developed muscularly. When the hand was lifted it fell listless, the legs similarly, and the head would have done likewise if allowed to do so.

There was no evidence of hydrocephalus. The head measured 17.5 inches, was round, and of good shape. The fontanelles were normal, the eyes were not oblique, there was no nystagmus. There were two teeth; the hair was fine and eyebrows not well developed; skin was soft and smooth, feet not markedly padded on soles but slightly at the heels.

Muscular system.—The muscles of the neck were unable to hold the head up. If the child was placed in sitting position it showed the *marked* kyphosis curve of weak erector spinae. There was possibly some atrophy of the leg muscles. There was no paralysis, spasticity, nor tremor. The child moved his arms more than the legs, but both a little. He did not grip with the hands. Lifting him by the armpits, the shoulders went up more than normal, but probably not so much as one would infer from pictures of muscular weakness in the texts. The joints seemed exceedingly flexible. The hands could fold over on the forearm to an angle of 35°. There was marked dorsiflexion of foot on tibia possibly to the same angle. No group of muscles showed hypertrophy.

All reflexes were normal. Dr. A. Gibson was kind enough to examine the electrical reactions, and his report is as follows: "I examined the electrical reactions of the muscles of W. E. G. In both the upper and both the lower limbs a normal reaction is obtained both to faradic and galvanic current."

An initial urinalysis showed its specific gravity 1.010, reaction acid, colour light amber, and no albumen, sugar, pus, deposits, casts, nor blood. The blood pressure was S. 90, D. 40, P. 108. The temperature was 98.3 per rectum.

Family History.—At the time of the child's birth the mother was 27 and the father 31 years of age; both were healthy and well. They were married two years before the first pregnancy, and this child is the product of that conception. There have been no pregnancies since.

None of the parents, uncles, aunts, grandparents, nor great-grand-parents showed any similar condition, nor any condition of muscular weakness whatsoever. The grand-parents are all living and in good health; the great-grand-parents died of senility (6), or of accident (1), or infection (1).

Diagnosis.—The condition suggested the following possibilities: malnutrition, rickets, idiocy, poliomyelo-encephalitis, muscular dystrophies, or amyotonia congenita.

(a) Malnutrition.—This was probably a factor in the child's condition when first seen, because of lack of food, due to weakness of the muscles of suction. There was no evidence of an ordinary case of malnutrition.

b) Rickets.—There were no bony signs to be found anywhere.

(c) Idiocy.—This can be excluded as a cause of the weakness because the child presents a condition, since he has been getting a normal supply of food, which seems normal in mentality. He was not deaf, nor blind, as one would think at first examination, and although he smiled very little he followed objects with his eyes (but not with his head). His smiles were probably few for the same reason that he sucked feebly. He possibly showed signs of fear, and certainly some signs of trying to make his wants known, and also of likes and dislikes. His negative signs of mental development were probably signs of muscular weakness. Besides, if mentally defective, into what class does he fall? He is neither micro- nor macro-cephalic, nor a mongolian, nor a cretin, nor epileptic, nor paralytic, and does not present signs of the amaurotic condition. The condition is not idiocy.

(d) and (e) The absence of any acute illness in the past, the absence of spastic paralytic symptoms, and the normal reactions rule out poliomyelo-encephalitis. The presence of the knee-jerks shows that there is no peripheral nor lower neuron trouble, and since they are hard to obtain, and not accentuated, there would seem to be little the matter with the upper neurons. A paresis from poliomyelo-encephalitis is seldom so wide-spread as is the muscular weakness in this case; it never involves all the muscles of an extremity to the same degree, and is almost never symmetrical, as is the condition with this child. These factors also negative any of the ordinary muscular dystrophies.

(f) There would seem to be nothing left but amyotonia congenita, which this case fitted in every way from a clinical standpoint. However, amyotonia congenita is probably, as Crozier Griffiths says, a condition described which may be due to various factors, but which is certainly obscure at the present time. This study was commenced with the hope that it might throw a little further light on this disease.

Preliminary Treatment.—A physician who had seen the child a few weeks earlier had advised artificial feeding. When first seen by one of us it was put back on breast feeding. Since it was too weak to nurse, the breast was milked and the milk given by spoon. The child soon gained somewhat in strength, and nursed the breast fairly well, regaining its weight. In August, the weight was 9.5 lbs., in September, 13 lbs.; in October, 15 lbs. and on November 1st, 18 lbs., a trifle underweight, but almost normal.

At the first visit, after having made a complete examination, and a temporary diagnosis of amyotonia congenita, massage was ordered daily. This has been kept up continuously. The gain in weight seemed only due to restoration of sufficient quantity of food, since the muscular condition did not by any means approach normal in November.

On November 1st the child was given cod liver oil, which has been continued since.

Preliminary chemical examination.—Two fairly complete chemical studies of amyotonia congenita have been made. That by Powis and Raper dealt with a girl aged 4 years, who showed marked increase in creatine, and decrease in creatinine excretion. There was also acholia, evidenced by fatty stools, though this was not considered as definitely associated with the muscular condition. The second case, a boy of 3.5 years, described by Ziegler and Pearce, showed a similar abnormal creatine-creatinine metabolism, increased rest-nitrogen and neutral sulphur in the urine, and diminished chloride excretion.

These cases were both considerably older than the child under consideration. Gamble and Goldschmidt have given figures for two normal children (slightly underweight) of about the same age and weight as W. E. G. One, G., 10 months old, 6.5–7.0 kg., excreted on a cream, water and lactose diet 60-65 mg. creatinine, and 40-50 mg. creatine per day, and on a whole milk diet 80 mg. creatinine and 94-105 mg. creatine, the difference being traceable to the change in diet. The second child, M., 14 months, and 6.5 kg. weight, excreted on the first-named diet 68-72 mg. creatinine, and 62-64 mg. creatine per day. W. E. G., at commencement of chemical examination, weighed 6.8 kg. If this were a similar case of amytonia congenita we should expect to find creatinine below 60 mg. and creatine above 50 and probably above 60 mg. per 24 hours.

It may be mentioned here that with the very young children dealt with in this paper it has not been found possible to obtain complete 24-hours' urines, even when in institutions. In the case of W. E. G. it was impossible for the parents to afford institutional treatment or special nurses. They made the greatest effort to collect complete specimens, and these are certainly comparable. The loss was probably much less than 100 c.c., but this figure has been added to the actual amount obtained in each case, so that the figures are certainly maxima.

Analysis of a 24-hours' specimen of W. E. G.'s urine showed *much less creatinine than normal, but only a trace of creatine.* Incomplete specimens on various dates were fully in agreement. They are shown in the following table. There and elsewhere in this paper figures for creatine are expressed in terms of creatinine.

Date Period of Collection	*Volume*	*Sp. Gr.*	*Per 100 c.c.*		*Total per 24 hrs*	
			Creatinine	*Creatine*	*Creatinine*	*Creatine*
	c.c.		mg.	mg	mg.	mg
Oct. 28, 7 p.m.—10 a.m.	95	1.007	16	1.5	—	—
Oct. 29, Afternoon	47	1.007	12.2	2.6	—	—
Oct 30/31, 24 hr.	(266)	1.0055	17.7	1.4	47	4
Nov. 13, Casual	—	—	34	3	—	—

During these and subsequent examinations, sugar, albumen, and acetone bodies were invariably found absent. The urine was light amber in colour, of low specific gravity, and either neutral or slightly alkaline. There was frequently a sediment of phosphates. Toluene was used as preservative throughout.

With the results given in the table above may also be compared the following:

Gamble and Goldschmidt have published an observation on a four months, 4.5 kg. infant fed breast-milk, which excreted 46 mg. creatinine and 11 mg. creatine per 24 hours.

We have examined the urine of three fairly normal infants, on normal artificial diets. The first had been admitted to the Winnipeg Children's Hospital for acidosis, and had recovered under treatment, the second to the same institution for indigestion, and the third to the Winnipeg General Hospital for bronchial trouble.

L.M., 7 months, weighed 13.25 lbs. An "almost complete" 24-hours' urine specimen, 285 c.c., acid in reaction, with sugar and albumen absent, contained 55 mg. creatinine, and 24 mg. creatine. The diet contained 750 c.c. whole milk per day, estimated to contain 9 to 10 mg. creatinine and 10-12 mg. creatine.

J. M., 9 months, weighed 12 lbs. An "almost complete" 24-hours' specimen of urine (245 c.c.) contained 39 mg. creatinine, and 19 mg. creatine. The diet contained 450 c.c. whole milk, estimated to contain 5 to 6 mg. creatinine, and 6 to 7 mg. creatine.

J. G., 16 months, weighed 20 lbs. A partial specimen (174 c.c.) of urine contained 60 mg. creatinine and 39.5 mg. creatine. The diet contained 750 c.c. whole milk.

While our normal figures are distinctly lower thon those of Gamble and Goldschmidt for children of the same age, they are still distinctly higher than those for W. E. G.

At a later date Dr. T. Ingvaldsen kindly measured for us the nitrogen partition on two 24-hours' specimens of W. E. G.'s urine, the first on a beef-broth and milk diet, the second on milk diet only.

	March 9/10		*March 14/15*	
Total N. in 5 c.c.	15.46 mg. =	100%	17.07 mg. =	100%
Ammonia-N.	1.12	7.2	1.63	9.6
Urea-N.	10.55	68.3	11.45	67.2
Uric acid-N.	0.21	1.4	0.27	1.6
Creatinine-N. ...	0.40	2.6	0.47	2.8
Creatine-N.	0.62	4.0	0.002	..
Unaccounted for	2.56	16.5	3.21	18.8

The nitrogen-rest figures do not appear to be abnormally high. There have never been any fatty stools. *The chemical picture is quite different from that of cases of amyotonia congenita previously studied, showing on the contrary more marked diminution of creatine than of creatinine.*

Cameron and Gibson have drawn the conclusion, from study of a case of muscular weakness in an adult man, and from the creatine-creatinine excretion in cases of amputation, that creatine is not formed in muscle tissue, but is absorbed by muscle and transformed to creatinine by some process involved with the carbohydrate metabolism of muscle and necessary for that.

Harding and Gaebler, from study of creatinine-creatine metabolism in young children, have also drawn the conclusion that creatine is not formed in muscle.

Since it has been shown that the creatine content in muscle steadily increases from traces in the foetus to nearly maximum amount fairly early in extrauterine life, in the case of rabbits and chickens (Mellanby) and children (Rose), the perhaps unlikely hypothesis suggested itself that some part, or even the entire early store of muscle-creatine in young mammals might be derived from the diet, *i.e.*, the milk of the mother (birds have a very different creatine metabolism from mammals). The milk of the mother of W. E. G. was examined therefore on the off-chance that some abnormality might be found. Denis and Minot's method was employed, and controls were carried out with normal cow's milk as purchased, and with normal human milk. The results are given in the following table, and Denis and Minot's figures are added for comparison. (It is assumed that in their tables "creatine" indicates total creatinine plus creatine. If that is not the case their figures are distinctly higher than ours. In the following table "creatine" indicates actual creatine, expressed in terms of creatinine.

	Mg. per 100 c.c. milk		
	Creatinine	*Creatine*	*Total Creatine*
Denis and Minot, Cow I....................	1.35	0.95	2.30
" " II....................	1.40	1.00	2.40
" " III....................	1.50	0.90	2.40
B. and C., Cow's milk, Nov. 13...............	1.06	1.29	2.35
" " Dec. 2................	spoiled	—	3.3
" " Mar. 26..............	1.6	1.8	3.4
Denis and Minot, Mother I..................	1.1	2.8	3.9
" " II..................	1.6	1.6	3.2
" " III..................	1.8	1.6	3.4
B. and C. Mrs. R. D., Mar. 23, '23.........	1.1	2.1	3.2
" Mrs. H. Mar. 26, '23.........	1.2	0.9	2.1
" Mrs. G. Oct. 31, '22..........	1.3	0.15	1.45
" " Nov. 13, '22..........	0.85	0.03	0.88
" " Dec. 2, '22...........	1.05	0.35	1.4

It is evident that Mrs. G.'s milk contained very little creatine, and consequently as a potential source of creatine for the child it was negligible. The sample obtained on Nov. 13th was examined for other constituents, and appears to be normal as far as the examination went.

	Mrs. G.'s milk	*Normal figures*
Specific gravity	1.0296	1.028—1.034
Water	87.45%	87.5%
Fat	4.02%	2—4%
Lactose	6.7 %	6—7.5%
Protein (from N.) ..	1.8 %	1.5—0.7%

Her creatinine-creatine excretion showed nothing abnormal. A sample of urine obtained on November 13th, contained 156 mg. creatinine and 29 mg. creatine per 100 c.c.

Further treatment.—With the idea that the deficient muscularity of the child might be due to some defect in its power of creatine formation, and might perhaps be associated with continued creatine-deficiency in the diet from birth, from November 15th breast-milk was continued, but the diet was amplified by the addition of beef-broth. This was prepared by cutting half a pound of round steak into small pieces, covering it with water, and bringing the whole to the boiling point, then allowing to simmer for three-quarters of an hour and straining. As far as possible it has always been prepared in precisely the same fashion. It was analysed at various periods with the following results:—

Date	*Mg. Per. 100 c.c.*	
	Creatinine	*Creatine*
Nov. 28, 1922	77	76
Nov. 30, 1922	93	66
Mar. 10, 1923	70	177

The results of this treatment were apparently beneficial. The benefit might perhaps be related to other constituents of the muscle-extract fed, such as carnosine, but these have not been related to degree of muscularity, while the creatine-creatinine metabolism has.

Condition during this period.—During January, February, and March, 1923, the boy was definitely growing and gaining strength. He developed spasmus nutans, which was attributable to his condition, and the fact that he was living in somewhat dark surroundings.

At the end of the beef-broth feeding period (April) he was much stronger, could turn over in bed, kick strongly, and make an effort to get his feet under himself. The arms moved strongly and freely, and he could grasp the finger of the physician.

Further examination.—It was found impossible to establish any definite relationship between creatine intake and output. Thus on Nov. 29/30 the child excreted about 170 mg. creatinine and 45 mg. creatine, and obtained from 243 c.c. of the broth 226 mg. creatinine and 130 mg. creatine, in addition to the amounts from the breast milk. On Mar. 9/10 it excreted approximately 90 mg. creatinine and 140 mg. creatine. It had been weaned on Dec. 7/9, and the diet now consisted of 170 c.c. beef broth (containing 119 mg. creatinine and 300 mg. creatine) and 48 oz. "milk" (9 oz. cream, 13.5 oz. skim milk, 8 table-spoonfuls of sugar, and 25.5 oz. water, containing about 6 to 8 mg. each of creatine and creatinine). Much more creatine than creatinine is unaccounted for.

Even allowing for considerable loss, the volumes of urine collected from this patient and normal Winnipeg children of the same age were much smaller than usual. This is explicable by the extreme dryness of the atmosphere in Winnipeg during the winter months, and the consequently much greater insensible perspiration.

On March 12th the beef broth feeding was stopped. A 24-hour specimen of urine on March 14/15 contained approximately 100 mg. creatinine and only 4 mg. creatine. It appeared that the child was still incapable of manufacturing the normal amount of creatine.

This point was tested further and more accurately. On March 15th the child had been put back on the combined diet. This was fed for the last time on April 28th, and then only a diet of 48 oz. whole milk was fed. The urine was collected at intervals of a few days; the specimens were as complete as possible, a specially devised rubber urinal being affixed to the child, and the only loss occurred when some urine slopped over during the night. The figures are certainly comparable. They have been corrected approximately by adding 100 c.c. to each measured figure, and the results are considered as maxima.

Date	*Period on milk diet only*	*Vol.*	*Total N.*	*Creatinine*	*Creatine*
	days	*c.c.*	*gm.*	*mg.*	*mg.*
April 28/29	0	(382)	3.1	121	398
May 2/3	4	(387)	2.5	96	50
May 9/10	11	(365)	2.5	63	39
May 14/15	16	(337)	2.3	67	21

The creatinine and creatine in the whole milk diet amounted to 15 to 18 and 18 to 20 mg. per 24 hours.

It is evident that there is a steady falling off in creatine excretion throughout the period, until ultimately the child is excreting as much as it receives in the diet, but no more. There is also a definite lowering in creatinine excretion, greater than could be accounted for from the previous diet. This is evident from the following data:

When creatine is fed to adult man in very large doses (20 gm.) it is completely excreted or destroyed within two or three days, and the same is true of creatinine (Rose and Dimmitt). Children apparently tend to retain both substances a little longer, though the excretion (and destruction) are apparently complete by the end of the third or fourth day after feeding (Gamble and Goldschmidt). The figures on May 2nd can therefore be considered as practically uninfluenced by the previous diet of beef-broth.

It would appear therefore that still, at the age of 16 months, W. E. G. cannot manufacture enough creatine for the muscle demand; when the outside store is cut off the muscle store is slowly deplenished, and the conversion to creatinine appears to fall correspondingly. It is to be expected that if the whole milk diet were continued there would be a decrease in muscle tone and strength.

The sample of urine on May 14/15 was examined further, and found to contain 0.71 gm. phosphates, and 1.85 gm. chloride (as NaCl). The phosphate excretion is normal, and the chloride excretion would appear to be even greater than that in the diet, since, according to Winter-Blyth the chlorine content of milk as NaCl is 0.1 per cent. corresponding to 1.2 gm. in 48 oz. of whole milk.

Condition of the child at the time of last chemical examination.—While, as above stated, at the end of the beef-broth feeding period, the baby was steadily growing stronger, on the contrary, on May 18th, there had been no further increase in muscular strength, but no definite conclusion could be drawn as to any regression.

Discussion of results.—It would appear evident that the child, for normal development, will require to be fed creatine (in beef-broth) continually.

It may be concluded with fair certainty that his condition is not similar to the only two cases of amyotonia congenita of which accurate chemical evidence is available.

Not only is the creatine metabolism different, but the nitrogen partition shows no particular abnormality, and the chloride excretion is certainly not lowered.

Further evidence of the dissimilarity of the two conditions is shown by consideration of Harding and Gaebler's "creatine coefficient." This, the combined creatine and creatinine excretion, expressed in terms of creatine, per kg. body weight, is practically constant for all ages, both for normal individuals, and for muscular dystrophic, hyperthyroid, and acromegalic patients, provided a high-protein, non-creatine diet be fed, and amounts to 22-24.

In the following table are included Harding and Gaebler's results for children between 2.5 and 3.5 years, Powis and Raper's case of amyotonia congenita, contrasted with two normal children on similar diet, Ziegler and Pearce's case, Gamble and Goldschmidt's figures for normal children on a low protein diet and our own case.

Subject	*Author*	*Age*	*Weight*	*Total N*	*Creatinine*	*Creatine*	*"Creatin. Coefficient*
			kg.	gm.	mg.	mg.	
Normal Girl, M.W.....	Harding-Gaebler	—	14.0	6.13	138	201	24
" H.C......	"	—	14.0	6.78	145	164	22
Normal Boy, G.L......	"	—	14.5	6.21	121	209	23
" V.D	"	—	15.0	6.85	125	232	24
" F.R......	Powis and Raper	3 years	14	3.1	239	59	25
" G.L......	"	2.5 "	14	4 34	192	81	23
	"						
Amyot. cong. Girl.....	"	4 "	9 7	3.73	67	118	22
" Boy.....	Ziegler-Pearce	3.5 "	13.35	2.98	95	93	16
Underweight C	Gamble-Goldschmidt	4 months	4.5	0.42	46	11	15
" S........	"	8 "	5.4	0.50	56	12	15
" G	"	12 "	7	1.20	63	47	18
" M	"	14 "	6.5	0.84	70	62	23
Present case, W.E.G...	Brereton-Cameron	10 "	6.8	—	46	4	5.8
" "	" May 2/3	16 "	11	2.5	96	50	15
" "	" May 9/10			2.5	63	39	11
" "	" May 14/15			2.3	67	21	9

It will be noted that the cases of amyotonia congenita show less creatine excretion than the normal children studied by Harding and Gaebler on high protein diet, though compared with children on similar diets, their creatine excretion is definitely higher. But *their "creatine coefficient" is approximately normal.* Gamble and Goldschmidt's figures for younger children on low protein diets are lower, but are still definitely higher than those for W. E. G. on a slightly higher protein diet. The comparison emphasises the conclusion that *this is not a case of amyotonia congenita.*

Summary

A case of muscular weakness in an infant is described, in which the clinical symptoms present some likeness to those in amyotonia congenita, but the chemical examination negatives this possibility. The creatine and creatinine excretion are both much below normal, and the child apparently cannot manufacture the normal supply of creatine. Feeding creatine in beef-broth appears to improve the condition. When the beef-broth is discontinued creatine elimination falls rapidly, and the muscular development shows no further increase. The infant was breast-fed for eleven months (with a short interval of a few weeks during the eighth month). The mother's milk contained the normal amount of creatinine, but only a trace of creatine.

Methods used:

Urine.—Creatinine was determined by Folin's method, using an appropriate creatinine standard. The picric acid used was tested by Folin and Doisy's method, and found satisfactory. Total creatine was determined by Gamble and Goldschmidt's method, autoclaving for 30 minutes at 125° to 130°. It was found that addition of 2 to 5 c.c. of N/1 HCl to 10 c.c. of urine gave slightly higher values than 1 c.c. (as recommended by them), and the higher amounts of acid were used in the later determinations. The other constituents were determined by the standard methods described in Underhill.

Milk.—Creatinine and creatine were determined by the method of Denis and Minot. For lactose determinations proteins were precipitated by phosphotungstic acid as recommended by Myers. Comparison of this with the usual acetic acid precipitation, with cow's milk, indicates that the lactose values are about 10 per cent. too low.

Beef-broth.—Creatine and creatinine were determined by Hammett's method for muscle extracts, using appropriate creatinine standards.

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Ocular Disturbances in Pregnancy and during the Puerperium.—In four cases of neuroretinitis of pregnancy with marked albuminuria and marked reduction of vision that have come under his observation, Nelson M. Black, Milwaukee, found in each case extremely active infectious processes in the teeth and tonsils. Unfortunately, the damage to the eyes had already occurred, but improvement in the ocular condition, which in two cases was marked, and in the other two slight, did not take place until treatment was directed to the infected teeth and tonsils. Black suggests the advisability of making, during gestation, in additions to the early frequent examinations of the urine which is practically always done, a search for possible foci of infection, especially in the teeth, paranasal sinuses and tonsils, and correct morbid processes when found, rather than running the risk of allowing the patient to proceed to term with possibility of having to terminate pregnancy in order to save life or preserve vision. It is also suggested that visual examinations should be made, as a routine procedure, during the later months of pregnancy, with especial regard to the fundus and visual fields.—*Jour. A. M. A.*, Aug. 18, 1923.

BIOPSIES AND THE COMPLETION OF CERTAIN SURGICAL PROCEDURES*

NORMAN B. GWYN

Toronto

THE findings in a small but interesting collection of certain tissues removed for examination from living patients, seemed to warrant the presentation of a short paper with the heading of "Biopsies." The failure on my part to insist upon the procuring of a small slice of kidney during an operation for the removal of renal calculi, made me realize that even clinicians may have a responsibility in certain surgical procedures, and may be guilty of sins of omission.

Biopsies are a regular part of many surgical operations; the frozen section technique has proven itself invaluable; we have some, though fewer opportunities, to make such examinations in a medical service; opportunities are usually associated with glandular enlargements easily accessible and at times giving information of the highest import. Other biopsies, of more purely medical interest are the examinations of tissue fragments frequently to be found in bowel movements, in the washings from stomach or bladder, or in the fluids aspirated from chest or abdomen; without question, in many instances, a diagnostic detail is carelessly thrown away; a detail which would perhaps settle a doubtful point.

Of the glandular enlargements much has been said and written; much has also been discarded; enlarged and isolated glands in unusual positions demand excision and examination, and a case of generalized tumefaction in the glandular system will not escape our observation without leaving at least one gland for section; if it does, valuable clinical information may be lost and the final determination as to whether we are dealing with a Hodgkin's disease, a tuberculous infection, a lymphosarcoma, a leukaemia or a condition of metastasis may be quite impossible. Of the enlargement of glands in isolated positions and of their removal for examination a few words may be said. Metastases of malignancy may appear anywhere, but from new growths hidden in the body metastases to the supra-clavicular glands occur more frequently than to any other gland group on the surface. Proof of this may be seen in the rather varied nomenclature which an enlarged supra-clavicular gland may acquire,—Virchow's gland, Cabot's gland, Osler's gland, the Sentinel gland": no other of the superficial glands has been so honoured.

A few words only need be said upon the question of the completion of certain surgical procedures. A kidney can always suffer the loss of a millimetre of substance; the upper surface of an enlarged liver, away from intestinal contact, might spare a sliver; a unique observation is recorded by Umber[1] in 1912; while removing the spleen from a case of Banti's disease he was induced to take a small specimen from the much enlarged liver; the liver later returned to a normal size; the specimen had shown a distinct peri-lobular infiltration. A case of Dr. J. E. Elliott and H. A. Bruce is of equal interest: it is reported below.

It might well be questioned whether one should touch the pancreas unless a part of the gland has been actually exposed: a recently appearing article speaks strongly against such a procedure.[2]

Some lantern slides of tissues procured under various conditions may be better arguments in favour of biopsies than many words, and the following cases may be described and illustrated in support of the above statements.

Case 1. Plate 1.—Tissue found in stomach washings from a case of obstruction of the pylorus; referred by Dr. C. N. Mooney. On inspection the material resembled a piece of bacon fat but there had been no meat of any sort eaten for days. The history of the case is that of ulcer of the stomach of twenty-five years standing · of late symptoms of obstruction with vomiting and rapid loss of weight, and the picture of the x-ray, have been in evidence. There was rapid improvement with gain of weight as a result of gastric lavage, and free Hcl was always present in large amounts in the stomach contents. The tissue, under the micro-suggests a fragment of a myxoma. There is also a little mass of fibrin containing leukocytes; there is some suggestive adenomatous structure; one would feel that the fibrin with the leukocytes would rule out any question of the tissue mass having been introduced into the stomach. The possibility of it being a fragment of a colloid carcinoma is to be considered.

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*Read before the pathological section, Academy of Medicine, February 20, 1923.

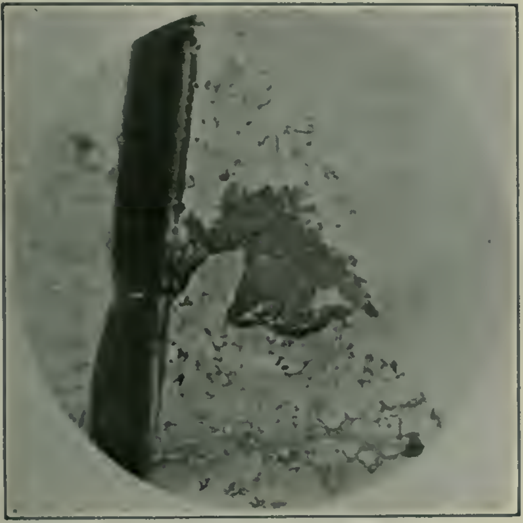

PLATE 1.

CASE 1—Tissue found in stomach washings showing a myxoma-like structure and fibrin mass with leucocytic infiltration. Cases showing conditions not unlike this have been reported by H. B. Anderson and others. Conditions such as lipomatosis, fibromatosis and polyposis have frequently been met with, and if in the neighbourhood of the pylorus these tumour growths easily produce obstruction. The patient from whom this specimen was removed seems now perfectly well 1 year later, and has regained all of his weight.

Case 2. Plate 2 A.B.C.—Section of a gland tumour mass removed from the back in a case that had presented the symptoms and appearance of Hodgkin's disease. There had been general glandular enlargement reaching an extreme degree and eventually, blocking of the sinuses and naso pharnyx. A diagnosis of Hodgkin's disease affecting the naso-pharnyx had been made by Dr. Perry Goldsmith by whom the case was referred to me. With the remarkable enlargement of all the glands had occurred the picture of myelogenous leukaemia, there being a blood count of 300,000 white blood cells, with 40% myelocytes. The gland removed shows that the condition was neither Hodgkin's disease nor leukaemia, but a lymphosarcoma.

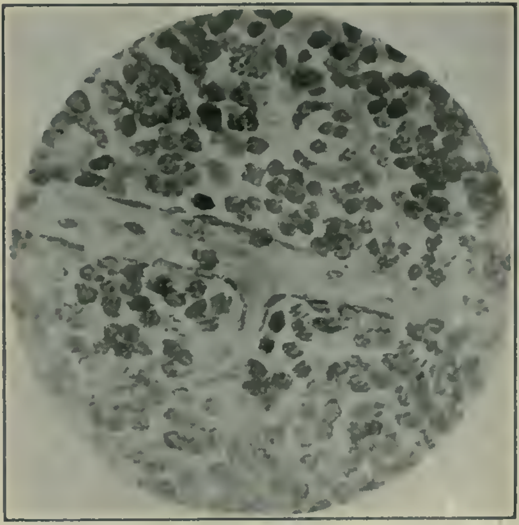

PLATE 2A.

CASE 2.—Section of gland showing complete transformation into lymphosarcomatous tissue.

PLATE 2B.

CASE 2.—Myelogenous-leukaemia-like blood picture from the case of generalized lymphosarcoma from which the gland in plate 2A was removed. This is perhaps the only case on record in which a blood picture of this sort has been found in connection with generalized lymphosarcoma.

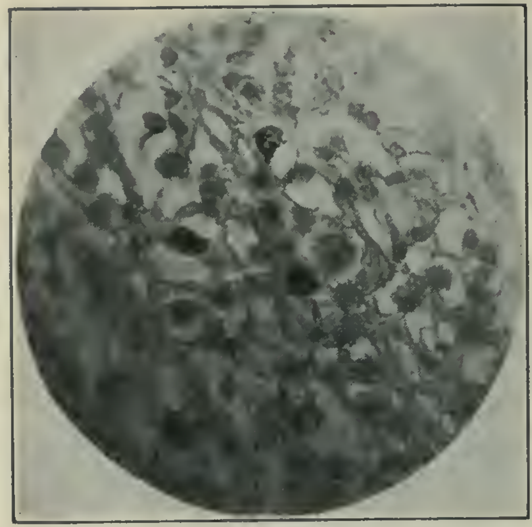

PLATE 2C..

CASE 2.—Gland from case of Hodgkin's disease for comparison.

Case 3. Plate 3.—Section of an enlarged left supra-clavicular gland, removed by Dr. Harris from a case seen with him and Dr. A. A. MacNamara. The history of the case was that of gastric distress for a year, (pain, burning, vomiting) and of late, laryngeal paralysis. Examinations, including x-ray pictures of the gastro-intestinal tracts and of the chest had shown no evident gross lesion. A large supra-clavicular gland had been noticed by the laryngologist, no difficulty was experienced in removing the gland which shows the evidence of metastasis of carcinoma.

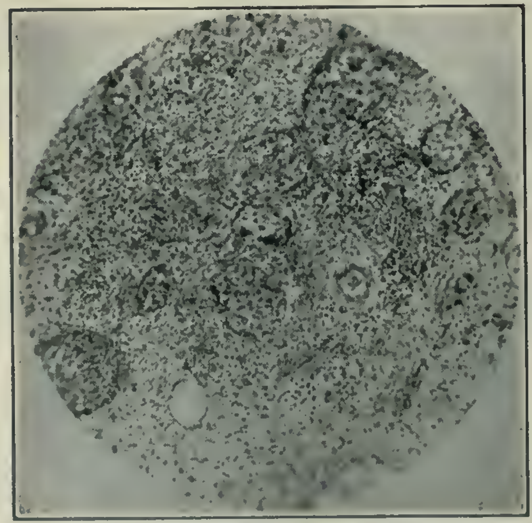

PLATE 3.

CASE 3.—Section of an enlarged supra-clavicular gland showing metastasis of carcinoma. In this case there had been marked gastric symptoms but there had been nothing suggestive seen in the x-ray examination of the gastro intestinal tracts.

Case 4. Plate 4.—Specimen of a small slice of kidney taken during removal of seven stones from that kidney. The patient is still alive after fifteen years, a woman of 68. The specimen shows well the chronic glomerulo-nephritis and arterial change; particularly evident is the thickening of Bowman's capsule. The patient had complained for years of abdominal pain with failing health, the appendix and right ovary had been removed, the right kidney had been stitched up to correct ptosis. There had been developing anginal symptoms; there was marked thickening of the arteries with a blood pressure of 280-160 m.m.; the patient was completely invalided and had given up her profession of medicine. Since the operation there has been slow gradual improvement, and in spite of the arterial condition she enjoys a comfortable existence.

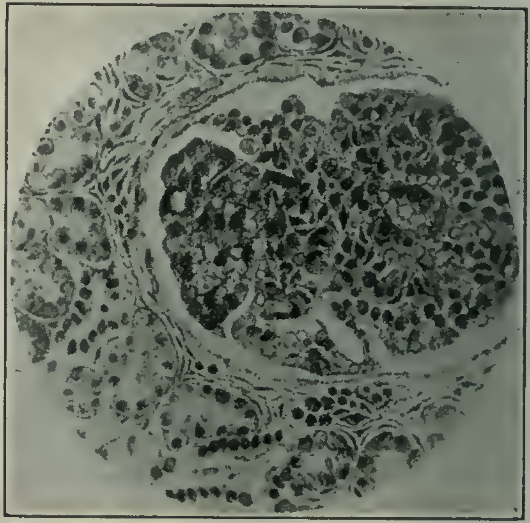

PLATE 4.

CASE 4.—A slice of kidney tissue taken during the removal of seven stones from that kidney. The marked thickening of Bowman's capsule and proliferation of the cells in the glomerular tuft is well shown. Patient, a woman of 68 years of age showing marked arterio-sclerosis and a high blood pressure of 230-130 is alive and fairly well after fifteen years

Case 5. Plate 5.— Piece of tissue taken from a kidney during the performance of decapsulation. Patient had been incapacitated with general oedema which had lasted for nearly a year; there was an enormous amount of albumin in the urine and many casts. After the operation the oedema disappeared and patient went back to work for seven years though never losing the albuminuria; he died as the result of a spreading cellulitis of the arm. The specimen shows that the kidney was the seat of extensive amyloid disease, both kidneys had appeared the same at operation, and suggested the large white kidney of chronic glomerulonephritis. It was interesting to note that in spite of the enormous albumin loss, patient kept his weight and showed but a slight anaemia during the seven years in which he was able to resume his occupation.

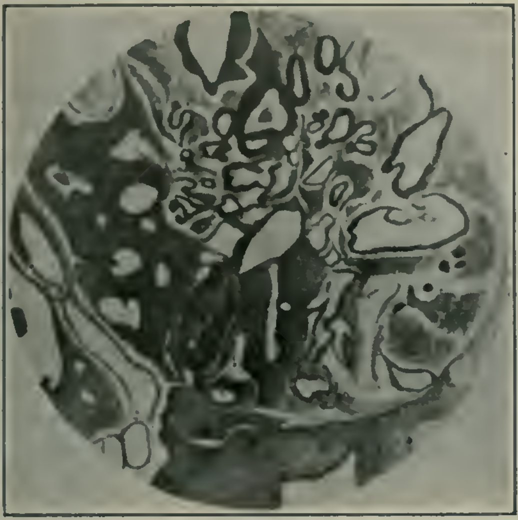

PLATE 5.

CASE 5.—Section taken from kidney during the operation of decapsulation for albuminuria and severe general oedema. Complete transformation of glomerulus into amyloid. Patient from whom this specimen was taken lived and worked for seven years after his operation, dying eventually of a cellulitis of the arm. He never lost his albuminuria though the oedema disappeared at once.

Case 6. Plate 6.—Reported by the kind permission of Dr. J. E. Elliott and Dr. H. A. Bruce, and to be reported in full elsewhere. A case of unusual interest and value since removal of pieces of liver for examination has been rarely done. In this case there had been some obstructive jaundice which had been relieved for awhile by drainage of the gall bladder. On the return of the jaundice and progressive symptoms a year later, Drs. Elliott and Bruce were persuaded to anastomose the gall-bladder into the stomach since a chronic thickened pancreas and occlusion of the common bile duct had been found. Before closing the abdomen a small section of liver was removed; following the cholecyst-gastrostomy which is now one year ago, the patient has improved to a remarkable degree. The section of the liver shows that the condition of obstructive biliary cirrhosis had developed as a result of the duct obstruction. The case is one of remarkable interest.

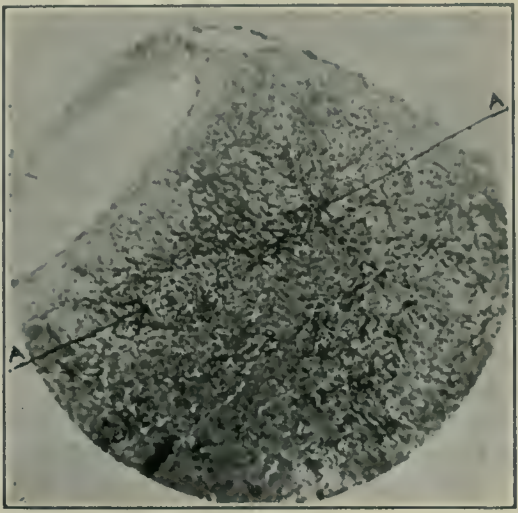

PLATE 6.

CASE 6.—Section of small piece of liver removed at operation of cholecyst-gastrostomy. Case of Dr. J. E. Elliott and Dr. H. A. Bruce detailed above. Perilobular infiltration is evident, and there are thickened areas in which dilated hepatic ducts can be made out as at points A. and A.

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(1) UMBER—quoted by Pearce, Krumbhar and Frazier, The Spleen and anaemias, *Munch. Med. Woch.*, 1912, LIX, 1473. ZEIT, *für. Klin. Med.*, 1904, LV, 789.
(2) DOWNES, *Journal of American Medical Association*, 10/2/23.

Incontinence of Urine after Childbirth.—Dr. Somerville draws attention to the value of electricity in this condition where the patients are much annoyed by the escape of urine from coughing or laughing or indeed on any sudden movement. After considerable experience of such cases Dr. Somerville commends a continuous current of 3 to 5 milliamperes passed for 3 to 5 minutes through an appropriate copper electrode introduced into the urinary canal and repeated on alternate days over a period of two weeks. The condition occurs also in unmarried women, and the same method of treatment is equally, and even more rapidly successful.—*B. M. J.*, Aug. 25, 1923.

THE PRESENT STATE OF OUR KNOWLEDGE REGARDING REJUVENATION

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During recent years much attention has been directed to operations of gland transplantation involving the testicles. These operations have been undertaken in the hope of removing disabilities incident to old age. The search for the fountain of youth is not new; it is not peculiar to our age and generation. Without reviewing the names and disappointments of the early seekers let us come at once to comparatively recent times. Probably the earliest attempt at transplantation of the reproductive glands was the work of Berthold[1] on fowls in 1849. He castrated cockerels and later transplanted gonad substance, coming to the conclusion that the development of secondary sex characters depended upon the testes. The work of Brown-Séquard is known to all. In 1889 he made extracts from the testicles of various animals and injected these into other older animals with apparently beneficial results. He then made an aqueous extract of dog's testicle and injected 1 cc. of this subcutaneously into himself. Extract of the testicle of a guinea-pig was also employed, and in all he received ten injections in a period of a few weeks. Brown-Séquard was 72 years old at this time and quite feeble. He states that from the time of the first injection he was much improved and that the beneficial effects were more pronounced after the others so that he regained the strength and ability to do mental work that had been his fifteen or twenty years before. He believed the spinal cord was the part particularly benefitted by the testicular extract.

Then follows an interval during which only sporadic work was carried out in this field. In 1912 renewed interest was manifested in the subject. The first reported transplantation in this country was by Hammond and Sutton[2] in that year. The work published at this time which attracted most attention was that of Steinach[3]. In this he cites experiments on young male rats resulting in the development of female sex characteristics and female mental attributes. The rats were castrated and ovarian tissue transplanted into them. He also discusses the function and significance of what he calls the puberty gland. These puberty glands are the interstitial cells of the testes and from Steinach's use of the word gland in connection with them there has been developed by the newspapers the term interstitial gland. The so-called interstitial glands do not exist as separate structures though it is possible that these cells and the germ cells, while anatomically associated, are functionally separate. Much that has been done since is based on this work of Steinach, who subsequently turned his attention to experiments on rejuvenation.

In 1920 he published a book[4] embodying his ideas on the subject and this has attracted wide-spread attention. Essentially his theory is that the sex gland increases in activity when the vas deferens is ligated. With increasing age the gland gradually loses its internal secretion. Steinach says the activity of the interstitial cells may be increased by the Roentgen ray, or by chemical means, but the surgical procedure of ligating the vas deferens is the simplest and most reliable. The blood vessels of the testicle must not be included in the ligature. Following the operation the germ cells atrophy, the symptoms of senility disappear and sexual desire returns. He states that the operation was performed on three old men in connection with another operation, that they did not know the purpose of the operation, and that in all three a good result was obtained.

Steinach's earlier work on transplantation of the sex glands has been confirmed by Sand[5] who states that special importance is to be attached to the interstitial cells in the testis, the theca-luteal tissue and corpus luteum in the ovary. Of particular interest are experiments in which he succeeded by simultaneous implantation of ovaries and testes in infantile castrated animals, in producing ovo-testes with full spermatogenesis and production of ovarian follicles. The secondary sex characteristics in these animals were partially male and partially female. He regards the endocrine, not the exocrine, sexual gland as the fundamental sex structure. In another article the same author[6] gives an account of an operation on a dog over twelve years of age in which a vasectomy was done on the left side and a resection of the epididymis on the right. The result was that the dog was again able to accompany a bicycle rider, the condition of his skin and hair improved, and six months after the operation he had coitus.

Others reporting work on the same lines, viz., ligation or grafting, with corresponding results are Lespinasse[7], Moore[8], Voncken[9] Falcone[10], Stanley and Kelker[11], Lydston[12], Lichtenstein[13], Levy-Lenz and Schmidt[14] and Hunt[15]. Some of this work has been purely experimental upon animals; some of it has been upon human patients in an attempt to relieve some one or other of the conditions which such a procedure is claimed to benefit. There are differences in technique and in material used. In those cases in which gland transplantation was carried out, the source of the gland and the amount varied; sometimes the gland implanted in a human being was from a human source, sometimes from an animal, sometimes the whole gland was transplanted, and at other times only a portion. The location of the graft might be in the scrotum, on the peritoneum, or in the abdominal wall. The fate of the transplantate was frequently necrosis with sloughing and the discharge of a yellowish pus; sometimes degeneration and replacement with connective tissue; sometimes, but very rarely, the graft appeared to "take." Usually in the case of a successful graft the tissue, after some time, undergoes degenerative changes, and with the progress of these changes the sexual instincts diminish.

Moore[8] repeated Steinach's transplantation experiments and his statements are worth noting as showing a conservative attitude. He says that the apparent effects are not so marked as one is led to expect from Steinach's reports. Somatic changes due entirely to the presence of the implanted gland are difficult to demonstrate. From the psychical side the results are more definite—young male animals have been converted into apparently typical females and young females have been converted into such apparently mature males that they react psychically as males.

Stanley[16, 17] has later reported the injection subcutaneously of strips of fresh testicle taken from the ram, goat or hog, into man. At the time of his first article referred to above he had treated over three hundred cases with animal testicular material and now reports one thousand injections into six hundred and fifty-six patients. These include cases of neurasthenia, senility, asthma, epilepsy, paralysis agitans, dementia praecox, locomotor ataxia, impotency, etc., and as a result he states that such injections do have a decided effect on the human body. Among the beneficial effects he notes improved eyesight, increased appetite, increased energy, increased mental activity.

Lick[18] in a review of the work of Steinach commends it in general. He does not believe, however, that ligation of the vas deferens or x-ray treatment of the gonads will bring about rejuvenation. He points out that both these procedures have been carried out for other purposes but it has not been observed that the patients get younger. He believes that suggestion plays an important part in sexual matters.

Romeis[19] states that he saw a patient in whom sexual desire returned after an operation for hydrocele. Stutzin[20] calls attention to the fact that for many years the operation of ligating the vas deferens has been performed in cases of hypertrophy of the prostate and has not resulted in a restoration of the youth of the patient. Tiedje[21] in an article reporting the results of ligation on the testicle with special reference to the question of the puberty gland states that it has never been proved that the interstitial cells have an endocrine function and that there is not one reason to believe in a "Pubertätsdrüse."

It should be pointed out that while there has been much controversy as to whether the testis produces an internal secretion or not it is generally conceded that it does. Gley has stated that to prove the point it is necessary to obtain from the blood the substance produced by the gland and to show that this substance will cause the same effects as the gland produces when functioning normally. The conditions here laid down have not yet been satisfactorily met in the case of the testis.

Meyer[22] studying the "interstitial sex gland" in women comes to conclusions the same as Tiedje. He says that an interstitial gland does not exist and that the word "Pubertätsdrüse" is without physiological meaning. A report of death following ligation of the vas deferens in a man with precocious senility, but otherwise healthy, is made by Mendel[23], who warns against this treatment. He also contends that neither the existence of Steinach's puberty gland nor the fact that ligation of the vas deferens between the epididymis and testis causes a rejuvenation of the interstitial cells has been proved. He regards transplantation of testicles as a more logical operation. Biedl[24], Kohn[25] and Fiebiger[26] do not agree with Steinach's teaching. Fiebiger is of the opinion that Steinach's results are not due to the operation but to cure of the scurf in the rats used.

According to Ishibashi[27] there does not appear to be a relation between the abundance of interstitial cells of the testis in man and the development of male sexual characters, nor is their hypertrophy necessarily associated with augmented functions of the parenchyma of the organ. Bolognesi[28] transplanted testicles showing hypertrophy of the interstitial cells and atrophy of the seminiferous tubules after removal of the vas deferens and epididymis into another animal. No change was observed in the animal receiving the implanted tissue, which degenerated into connective tissue. He concludes that the internal secretion of the testis is not derived from the interstitial tissue.

Summary

Such is the chaotic condition of the literature, making it exceedingly difficult to draw conclusions. There is no doubt that the sex glands exercise an influence upon development, especially of the secondary sex characters and indirectly, therefore, upon the organism as a whole. This influence is most easily explained by the hypothesis of an internal secretion, possibly produced by the interstitial cells, even if the existence and nature of such an internal secretion has not been proved satisfactorily. Attention has been drawn to the doubts which have been cast upon the rationale of Steinach's ligation operation. It produces, according to the originator, a pressure degeneration of the specific sex cells and hyperplasia of the interstitial cells. Might not the pressure produce reflexly such effects as described, increased sexual desire, etc., since in the normal individual similar effects follow accumulation of testicular secretion.

One of the unfortunate results attending the publicity that has been given this matter is the idea so widely entertained by the laity that any old man who has enough money to pay a young man to part with one of his testicles and to pay a surgeon to perform the operation of transplantation can have his youth restored: and, conversely, the old man who has not the money must grow old and die sooner than would otherwise be the case. Obviously such an operation, entirely apart from its merits, must be of very limited application. Though only one sex gland need be sacrificed by the person furnishing the organ, it is not easy to find men willing to make that sacrifice and to undergo an operation with its attendant dangers and suffering. Also, for the protection of the recipient the gland must be free from disease. It is true that some have thought that satisfactory results were obtained by transplanting testicles from other animals into man.

Sufficient time has not yet elapsed in the case of any type of operation to say that life has really been prolonged. The hope that is back of all such procedures is that the length of life may be increased thereby. All that has been accomplished up to the present, even in the opinion of the optimistic, is a revival of sexual desire and ability with possibly an improvement in the general physical condition. The fact that the patient expects certain benefits from such a treatment may account for some of the results obtained. Even those best able to judge admit the possibility of suggestion playing a part, and it is questionable whether it can ever be entirely ruled out. The question as to whether re-excitation of sexual activities is desirable or not is debatable. Lessening of these activities is one way in which the body conserves energy and to re-awaken them may mean the expenditure of energy that is required to carry on the vital functions, or at least might be used to better advantage in this way so far as prolongation of life is concerned.

If the germ cells have ceased to function their function is not restored. The fundamental purpose of life is reproduction and when a living organism becomes unable to reproduce it is deteriorating and death is approaching. Man may prolong life beyond this point by various means—sanitation, medical treatment, etc. The interstitial cells of the testes do not give the ability to reproduce, except possibly indirectly by promoting sexual desire and ability to copulate, and it seems probable that the rejuvenation so-called is a pseudo-rejuvenation and that length of life is not prolonged.

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The Value of Egg Yolk in Rickets.—In view of the high content of fat-soluble vitamin in yolk of egg, and the close association in nature of this vitamin with the antirachitic factor, as best exemplified in cod-liver oil, it appeared worth while to A. F. Hess, to test the potency of the yolk in relation to its prophylactic and curative value in rickets. Rats were fed on a low phosphorus diet, as a basic rickets producing dietary, and to this diet 0.5, 0.3, and 0.25 gram of egg yolk was added daily. Experiments showed that egg yolk is able not only to protect young rats from rickets, but also to cure them of rickets. On the other hand they showed that white of egg is not merely devoid of antirachitic properties but seems to enhance the rickets-producing quality of a dietary. The yolk of one egg was added to the regular formulas of each of twelve infants, in the attempt to forestall the occurrence of rickets and the seasonal ebb of the blood phosphate. In most instances this addition was made in December, when the tendency to rickets becomes acute. By this simple supplement to the diet all the infants were protected from rickets as judged by clinical, x-ray, and chemical criteria. The percentage of inorganic phosphate in the blood, instead of falling to 3.6 mg., the ebb observed last March, was maintained at 4 mg. or more, a level encountered during the summer months. The calcium content of the serum also was unusually high. It seems evident, from these data, that yolk of egg possesses considerable protective value in rickets.—*Journ. Amer. Med. Assoc.*, July 7th, 1923, p. 15.

The Occurrence of Blastocystis in Intestinal Inflammation.—Kenneth M. Lynch, Dallas, Texas, records a case of acute diarrhoea of three months' duration in which *Blastocystis* occurred in small numbers and of small size in the passed stool, but in large numbers and in large, actively dividing form in preparations taken directly from cleaned rectal ulcers of unexplained origin, thus seeming to warrant suspicion of its connection with the ulcerative process. The organism was not obtained in culture in this case. In this instance it is worthy of note that *Endolimax nana*, although present in the stool, did not occur in the ulcers. —*Jour. A. M. A.*, Aug. 18, 1923.

COMPARISON OF QUANTITATIVE TESTS FOR SUGAR IN URINE

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DESIROUS of examining the practical value of various quantitative tests for sugar in urine, and of demonstrating a simple yet accurate clinical method, I entered upon a series of experiments the results of which are recorded in this article.

Taking the Benedict method as a basis for comparison, I extended my experiments to include the saccharometer fermentation test, and later, Pavy's method of estimation. A supply of urine from diabetic patients in the Winnipeg General Hospital has been available and the figures I obtained have shown a wide range of sugar excretion. These tests have led to a certain definite conclusion; namely, that the Benedict method, modified as I will show, is the best clinical way to make a rapid and reliable estimate of the total sugar present in a 24-hour specimen of urine. I wish to point out that this method has been suggested and used before, and my work has been entirely a practical demonstration of its usefulness.

As a preliminary step, Haines' solution was used to determine the presence of sugar by placing about 1 inch of reagent in a test tube, heating to boiling, and adding urine slowly from 1 c.c. pipette. If sugar were present a red precipitate of CuO was thrown down, and the amount of urine required thus indicated to some extent the concentration of sugar in the specimen.

This was followed by the original Benedict method, using 15 gms. crystalline sodium carbonate, talc. and 25 c.c. Benedict's reagent, boiling the mixture and running in from a burette, urine diluted up to 1 in 10 according to a rough estimate from the Haines test. Calculation was based on the fact that 25 c.c. Benedict's reagent are reduced by 50 mgms. glucose. This method is very accurate and the reagent keeps indefinitely. The principal objections to it are that there is a needless waste of material and that considerable apparatus is required.

The familiar fermentation test was next done. A small piece of yeast was added to 10 c.c. urine, well shaken, and the mixture poured into an Einhorn saccharometer which was left at room temperature for 20-24 hours. The sugar present fermented and the CO_2 collected in the tube was read off as percentage sugar in 24 hours. In my 36 experiments I did 25 fermentations and found this test to be quite unreliable. Ten tests gave no result whatever, only two were approximately correct, and the percentage errors in the remainder were roughly—

95%	21%	29%	79%	44%
36%	17%	35%	66%	..
38%	27%	72%	87%	..

or an average of 50%.

At first I kept the tubes at ordinary room temperature which in most cases goes down at night. This gave poor results, so I tried a well heated room which improved the results somewhat but still gave some negatives and low readings in the remainder.

Pavy's method proved quite effective and gave results which corresponded closely with those obtained by the Benedict test. A mixture of 20 c.c. water, and 20 c.c. reagent was heated to boiling and well diluted urine was run in from a burette until the solution turned colorless indicating the end point. The advantages of this method are:

(1) The solution is cheaper than Benedict's.

(2) The end point is clear and colorless.

(3) The reagent keeps indefinitely.

Objections to it are:—

(1) Fumes of strong ammonia are evolved by the boiling process.

(2) Considerable apparatus and time are required.

(3) A degree of skill is necessary to obtain the end point quickly enough, and yet accurately before the ammonia is boiled away and the consequent precipitation of CuO takes place.

Calculation was based on the fact that 10 c.c. of Pavy's reagent are reduced by 5 mgms. of glucose. This method is trying to the patience and often requires to be repeated because of the seemingly treacherous end point.

For clinical purposes my fourth method, a modification of Benedict's seems to me to be best since—(1) Little apparatus is needed. (2) It can be done in a few minutes. (3) Only 1/5 of the original quantities are used. (4) It is simple and reliable.

The test is done as follows:—A 24-hour specimen of urine is collected from the patient, shaken thoroughly, and a sample taken which should be tested within a day if possible. 3 gms. roughly, of crystalline sodium carbonate are placed in a test tube, with a little talcum to prevent bumping, and exactly 5 c.c. Benedict's reagent added.* This is held over a flame and kept boiling while urine is added drop by drop from a graduated 1 c.c. pipette until the blue color has entirely disappeared and a white end point obtained. With alkaline urine the end point is usually a brownish white. The reading is taken from the pipette and calculation made as follows: —

Suppose the 24-hour specimen is 2,000 c.c. and the pipette reading is 1.25 c.c. of urine. Since 5 c.c. Benedict's solution are reduced by 10 mgms. glucose, and since 5 c.c. Benedict's are reduced by 1.25 c.c. urine, it follows that 1.25 c.c. urine contain 10 mgms. glucose. Therefore, in 24 hours the total output of glucose in the urine is $-\frac{2000}{1.25}\times 10 = 16{,}000$ mgms. or 16 gms.

Expressed in terms of percentage the result would be $\frac{16}{2000}\times 100 = .8\%$.

My results for 36 tests in which I compared the original Benedict's method with the shorter test show that—

4 had a difference of 5-10 grms. in 24 hours.
3 " " " " 3-5 " " " "
10 " " " " 1-3 " " " "
19 " " " " less than 1 " " "

That is to say, 29 out of the 36 gave a result entirely acceptable for clinical work.

Total 24-hr. output .c.c.	*Benedict*			*Fermentation gms.*	*Pavy. gms.*
	Burette gms.	*Test tube gms.*	*Difference gms.*		
2760	10.961	11.128	.167	neg.	
2640	41.904	36.164	5.740	33.0	
1950	10.263	10.000	.263	neg.	
1000	16.339	11.904	4.435	neg.	
1320	45.517	45.517	0.0	33.0	
1170	62.555	65.000	2.445	18.0	
855	7.077	6.679	.398	1.6	
2940	64.192	61.250	2.942		
4450	88.293	86.575	1.718	27.8	
4040	43.537	40.400	3.137	neg.	
1575	8.422	8.075	.347	1.0	
3770	16.348	15.643	.705	9.425	
990	33.000	26.975	6.025		
1620	15.758	16.822	1.064		
1680	28.668	31.100	2.432		
2520	21.017	21.724	.707	12.6	
1965	28.546	29.772	1.226	22.79	
1950	15.738	15.476	.262		9.535
1500	7.128	6.976	1.152	neg.	4.411
1800	4.306	4.390	.084		5.368
1650	7.093	7.819	.726		6.407
2040	5.124	5.469	.345		9.160
1200	15.113	14.814	.299		20.870
1755	4.594	5.433	.839		8.688
1850	22.478	23.591	1.113	14.8	18.781
1170	13.700	12.580	1.120		12.447
2865	96.790	86.818	9.972		88.153
1500	50.000	60.000	10.000		50.000
800	4.188	4.210	.022	neg.	3.864
1900	24.173	23.750	.423	neg.	20.765
1520	11.226	11.176	.050	7.3	10.555
1980	152.309	157.142	4.833	158.4	165.000
1200	9.884	10.000	.116	.48	9.523
1000	4.721	5.263	.542	neg.	4.366
1200	37.267	37.500	.233	40.32	32.000
1020	37.918	39.534	1.616	48.96	36.429

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*Benedict's reagent can be obtained from Hynson, Westcott and Dunning, Baltimore, Md., or can be prepared according to this formula:

$CuSO_4$ (cryst)	18 grms.
Sod. Carb. (cryst)	200 "
Sod. Cit. or Pot. Cit.	200 "
Pot. Thiocyanate	125 "
Pot. Ferrocyanide (2%)	5 c.c.
Dist. water to	1000 c.c.

Copper sulphate must be weighed accurately, and dissolved separately by aid of heat. The carbonate citrate and thiocyanate are dissolved together, ferrocyanide added, and then the copper sulphate.

Sugar Tolerance Testing.—It is recommended by Richard A. Kern and Leon Jonas, Philadelphia, that in sugar tolerance testing blood sugar estimations be made routinely just before one-half hour, one hour and two hours after a standard glucose meal. The curve of alimentary hyperglycemia may reach its maximum and return to normal within one hour after glucose ingestion. This is true in certain diseases, notably mild diabetes mellitus, as it is in normal persons. In order to differentiate such cases of mild diabetes from conditions in which there is a lowered renal threshold for glucose, it is necessary to determine the blood sugar percentage at less than hourly intervals. —*Jour. A. M. A.*, Oct. 27, 1923.

Case Reports

REPORTS OF TWO UNUSUAL CASES IN SURGICAL PRACTICE*

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I propose to-day to present two cases under the title of this paper. The first case, that of a tumour of the spinal cord, does not occur very frequently even in large neurological centres. It does, however, undoubtedly occur more frequently than is generally supposed, many cases going down unrecognized to an inevitable fatal termination.

Intrathecal Tumour of the Spinal Cord.

Case No. 1.—F. G., a female, aged 26, a mother of 3 children, came under observation March 10, 1922, eleven days after giving birth to a healthy child.

Previous History.—The patient who is a very intelligent woman, states that her present condition began 3½ years previously, two days following the birth of her second child. At that time she was seized with a dull pain under her left breast along the ribs which lasted a few hours each day for a week. It then left her and returned again in a month. The pain became more constant, although part of the night was spent in comparative comfort. Walking or standing seemed to increase its severity. She was treated for neuralgia and rheumatism, and states she got considerable relief by taking small doses of aspirin. Her symptoms remained about the same for two and a half years; the pain then became bilateral with increased intensity and was most marked between the shoulder blades. Her legs would fall asleep when she sat in a chair for a few minutes. She required assistance in walking and had difficulty in controlling her limbs.

Present History.—Upon examination the patient presented the typical appearance of spastic paraplegia. When assisted, she attempted to walk with an extremely spastic gait. There was no atrophy of the limbs; the knee-jerks were exaggerated on both sides; and a marked ankle-clonus was present, especially on the left side. The plantar reaction was extensor. She refused to enter the hospital and returned to her home. Her condition became gradually worse and about May 1st, 1922, she was seized by a pain much more severe than usual which lasted twelve hours; when it passed off she noticed she was completely paralyzed from the waist down. After this time the pain was of the girdle type above the umbilicus, was not so severe, and did not last so long. Upon admission to the hospital, May 16th, she presented the typical picture associated with a transverse lesion of the cord. She had anaesthesia below the 10th dorsal segment, and had lost control of bladder and bowel.

In arriving at a diagnosis trauma, tuberculous disease of the spine, and syphilis were excluded, and the diagnosis of a tumour of the cord was made. On May 20th, laminectomy was done under ether anaesthesia; the 7th, 8th, and 9th dorsal laminae were removed and the tumour and cord exposed.. The pulsation of the cord was normal above the tumour and entirely absent below. The tumour, which was about the size of a walnut, was removed without difficulty although it extended along the nerve root for some distance into the intravertebral foramen, between the 7th and 8th dorsal to the left side. After removal of the tumour normal pulsation returned along the whole length of visible cord. The tumour was described in the pathological report of Prof. Lindsay as "Gliosarcoma."

Tactile sensation began to return the second day following the operation, and on the 7th day the patient was able to move her toes. Periodical attacks of pain returned with great intensity, radiating down both legs, and lasting from half to one hour every six to eight hours. Anaesthesia was replaced by hyperæsthesia so marked that the slightest touch of the cutaneous surface would cause excruciating pain.

Upon discharge from the hospital, July 21st the patient was taking from 3 to 4 grains of morphine hypodermically. After returning home she gradually regained motor power, the attacks of pain gradually grew less. Control of the bladder became normal about the 7th month after the operation. The bladder, however, remained very irritable, and she was readmitted to hospital June 21st, 1923, when we improved this condition by removing a stone the size of a large almond. At the present time she has no pain, does not require morphine, and is able to walk with the assistance of a cane. Her reflexes are, however, slightly increased.

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*Read before the Alberta and Saskatchewan sectional meeting of the American College of Surgeons, Edmonton, September 15, 1923.

With regard to the diagnosis, I wish to emphasize the essential feature of the clinical history: pain long precedent to paraplegia characterized by remissions and varying in intensity.

Post-operative Tetany with Implantation of Human Parathyroids.

Case No. 2.—E. M., a female, aged 27, was admitted to the hospital February 1st, 1923.

Previous History.—Shows that she has had no serious illness, she is the mother of two children, the youngest 3 years old; she had no complications or symptoms of tetany with either of her previous pregnancies.

Present History.—For the past year she has suffered from well-marked exophthalmic goitre with exacerbations and remissions. She became pregnant two months prior to admission, which resulted in an exacerbation of the disease. Her condition on admission showed marked tremor, a high degree of exophthalmos, and a pulse rate ranging from 120-160, with marked gastro-intestinal symptoms, vomiting and diarrhoea. With absolute rest in bed and usual treatment these symptoms abated considerably. The pulse rate dropped to 100-110, and the tremor and gastric symptoms improved.

On March 7th, ligation of both thyroid arteries was done with the patient in her bed under nitrous-oxide gas analgesia combined with novacain and followed by infiltration of quinine and urea hydrochloride. Very definite improvement followed and in three weeks' time, March 27th, double lobectomy was performed, using the same combination of anaesthetics, the patient being anaesthetized in bed before being taken to the operating room. The operation consisted of excision of the upper 4/5ths of both lobes and the isthmus leaving the posterior and lower portion *in situ*, attached to the inferior thyroid arteries.

There was nothing unusual post-operatively until the morning of the 3rd day when the patient began to show very definite symptoms of tetany, and complained of numbness and twitching. These symptoms increased rapidly. During the next 24 hours the fore-arms became flexed at the metacarpo-pharangeal joints and held rigidly in adduction, the thumbs were drawn into the palm. The legs were straight and stiff with the toes in plantar flexion. Chvostek's sign was present. The rigidity of the limbs was constant with periodical twitching of the muscles of the face. 30 grain doses of calcium lactate were given every 4 hours for 6 doses which seemed to improve the patient considerably.

On April 1st, the 5th day following the operation, the inferior parathyroid glands of a boy 10 years of age, accidently killed, were transplanted beneath the pectoral muscle of each breast, special care being taken to free the graft bed from fat. The glands were obtained and inserted within 4 hours of the boy's death. The wounds healed by first intention.

The dose of calcium lactate was reduced to 10 grs. twice daily and discontinued in six days. By the 5th day following the insertion of the parathyroid glands, the symptoms were very much improved and continued to disappear until she was discharged 10 days later without a single symptom of tetany. At the present time she informs me she has never felt better in her life, her general condition has improved, the exophthalmos is reduced considerably and Chvostek's sign is absent.

With regard to the treatment of post-operative tetany following the removal of the parathyroids, it is generally conceded that the only hope lies in successful transplantation of parathyroid tissue. It is difficult to explain the onset of tetany in this case. Was it brought about by the complete removal of all functioning parathyroid tissue at the time of operation? or was it due to a temporary cessation of function as the result of operative trauma? At the time lobectomy was performed the patient was four months pregnant. McCallum claims that tetany occurring in pregnancy is due to the loss of calcium supplied by the maternal body in building up the foetus. It is hard to conceive that the four months foetus would deplete the body to that extent. So great an authority as Mr. James Berry of London, declares in the British Journal of Surgery, April 1921, that tetany only occurs in total thyroidectomy because no thyroid substance is left and that the thyroid and parathyroid tissues are identical in function. Such teaching if followed will sooner or later be associated with disaster. One should not disregard the possibly separate function of the parathyroids, and in operating one should adhere to the principle of "safety first" as their removal may undoubtedly be followed promptly by tetany.

Treatment of Xanthoma Palpebrarum with Finsen Light. — S. Lomholt (*Ugeskrift for Laeger*, May 31st, 1923, p. 390) notes that as xanthoma palpebrarum is a perfectly benign and painless growth, doctors are seldom called on to treat it, although in his experience it is a very common condition. From the cosmetic point of view, however, it is a serious condition, and at the Finsen Institute in Copenhagen the usual practice adopted in these cases up to the spring of 1922 has been to give radium treatment. But this treatment proved tedious, and better results have recently been achieved with concentrated carbon arc light applied in the same way as for lupus. A single exposure of about one hour was in some cases repeated three or four times, a certain interval being allowed between each exposure for the reaction to subside. At the Finsen Institute 11 cases have recently been treated in this manner, and the results have been very good. The yellow patches disappeared completely, or almost so, and without the formation of any scar. Only in a few cases there was a slight pigmentation left in the periphery of the area treated, and it should be noted that such pigmentation may exist before treatment. Provided the first course of treatment is adequate, there seems little chance of relapses *in situ*, but this treatment does not, of course, prevent recurrence of the disease in new areas. The author concludes that even in the tuberculous form of the disease, Finsen light is superior to any other form of treatment.—*Brit. Med. Jour.*, Aug. 11, 1923.

Diagnosis of Lead Poisoning.—A. Feil and R. Heim de Balsac (*Paris méd.*, May 26th, 1923, p. 463), after examination of 179 workmen employed in factories where lead was used, came to the following conclusions with regard to the value of the various clinical signs in the early diagnosis of plumbism: (1) Some signs are of real value, such as the blue line on the gums, which is the most frequent and earliest manifestation. It was present in 65 per cent. of 96 workmen engaged in an accumulator factory, and was also found in 65 per cent. of 83 carriage painters. In 25 per cent. the blue line was very distinct, and in 40 per cent. faint. Most of the workmen with the blue line also showed red cells with basophil granulations, but in about one-tenth of the cases only one of these two signs was present at a time. In 5 to 6 per cent. of the cases lead colic was an initial sign, being found in 7 per cent. of the workmen in the accumulator factory and in 6 per cent. of the carriage painters. Parotitis was found in only 3 out of 97 workmen, and therefore possesses less diagnostic value. (2) The other clinical signs, such as myalgia and arthralgia, rise of blood pressure, and gout, do not possess any specific character, but are late phenomena. The same may be said of nephritis, anaemia, paralysis, and tremors, which all indicate profound and old-standing systemic intoxication. (3) With the exception of the blue line, clinical signs are too often absent at the onset to justify waiting for their appearance before starting prophylactic treatment. Laboratory methods, therefore, such as search for red corpuscles with basophil granulations, and examination of the urine for lead, should be chiefly relied on to prevent plumbism in workmen engaged in factories where lead is employed.—*Brit. Med. Jour.*, Aug. 4, 1923.

Editorial

PROPOSED BANTING MEDICAL RESEARCH FOUNDATION

IT is difficult to realize at such short range just how important an influence the work of Dr. Banting and Mr. Best has been in stimulating medical research in Canada, and indeed throughout the civilized world; but it seems likely that history will view the discovery of insulin, not only as a valuable contribution to the science of medicine but of peculiar significance in as much as the efforts of several ancillary sciences were focussed upon its discovery. In a peculiar way, therefore, the work of Banting and Best represents medical research at its highest. So far as Canada is concerned we may be forgiven our special pride, in that our own sons, in our own country, have produced something so worthy of the noblest traditions of our calling, and, that their discovery was given freely to the whole world. We are well aware that Canada has produced many exceptional men of science, but only too many whose contributions have brought renown alone to the countries of their adoption, rather than to the land of their education and birth.

Anything, therefore, which promises to foster native talent, to facilitate good work "at home" surely merits our approbation, and for this reason, if for no other, we welcome the announcement of a plan for the establishment of the Banting Medical Research Foundation. In brief, an attempt is to be made to collect a sum of one million dollars in Canada, Great Britain and the United States, with the avowed intention of encouraging medical research in this country. The appeal is to be made on account of the free gift of insulin to the world for the control of a dread disease and all that that means in the prolongation of human life, and the alleviation of human suffering. An indication of the amazing financial benefit of insulin in one direction only, is to be found in an estimate of one large insurance company of the United States, namely: that, should insulin prolong the life for one year of the diabetics insured in this one company, it would mean a gain of $2,000,000; and surely the humanitarian phase of such an appeal should measure even larger in the minds of all generous people in the world.

It may be said that the universities of this country provide ample facilities for work, and this is largely true; but is not a consideration worth while of the possible influence of something more? For example, should this research foundation emerge into a life of full activity, any man or woman possessing sufficient training and ability to think out some new method of investigation of value, as Banting himself did, would there find help and guidance in the fulfilment of his or her desire for purely medical research, or research in such related subjects as Physiology, Pharmacology, Biochemistry, etc. Surely this is the much desired democratization of Research, such as is found in the Pasteur, Lister and Rockefeller Institutes of other countries.

The general plan of organization and the launching of the appeal for funds is in the hands of a small committee composed of: John W. Rogers, Esq., Toronto, *Chairman;* George David Stewart, M.D., President of the New York Academy of Medicine; J. G. Fitzgerald, M.D., Professor of Hygiene and Preventive Medicine, University of Toronto; George W. Ross, M.A., M.B., M.R.C.P., Toronto; John A. Stewart, LL.D., Executive Chairman Sulgrave Institute, New York. Edwin L. McCormich, Esq., Toronto, has been appointed as secretary. Whatever money is collected will be transferred to another committee, composed of leading citizens of this country, whose duty it will be to organize the institution on a permanent basis.

THE ETIOLOGY AND TREATMENT OF SHOCK

At the recent International Congress of Surgery an interesting discussion took place on the subject of shock, its cause and its treatment. The subject was introduced in a paper by Crile, of Cleveland, who regarded the body as an electro chemical mechanism, and interpreted the symptoms met with in shock on that hypothesis. Dr. Mocquo, of Paris, stated that the prognosis of traumatic shock might be calculated by the central temperature, the determination of the arterial tension and by analysis of the urine and the blood. The recovery of the urinary function, a discharge of urea and the diminution of blood urea content were the best signs of a favourable prognosis. Mr. Fraser, of Edinburgh, referred to the many theories which had been propounded as to the cause of shock. Crile and Mummery had argued that sensory stimuli produced a rise in blood pressure from the irritation of the pressor nerves, but finally exhaustion of the vasomotor system took place followed by dilatation of the peripheral vessels and a fall of blood pressure. Yandell Henderson, in his acapnoea theory assumed the sequence as follows: hyperpnœa, acapnœa, failure of the vasomotor pressor mechanism, fall of blood pressure, and possibly a secondary concentration of the blood. Meltzer believed that the stimulus of injury resulted in an inhibition of the functions of the spinal cord. All these theories had been shown to be based on defective observations and were, therefore, erroneous.

An intense investigation of the conditions existing in shock was undertaken during the great war. At the present the most that can be said is, that shock is a state of depression of all the vital functions of the body, this state being primarily induced by the infliction of severe injury on the body tissues, and being characterized by a progressive fall of the blood pressure. The problem still is to explain this progressive fall. He regarded the other symptoms as secondary to this one. In health there were three factors maintaining the blood pressure, the heart, the vasomotor mechanism, and the blood stream. It had been shown that there was no interference with the nervous mechanism of the heart even in profound shock. Mann had shown that apart from myocardial disease an efficient contraction of cardiac muscle can be guaranteed as long as the heart is properly supplied with blood. In reference to the vasomotor mechanism Malcolm and others have asserted that the vessels are actually contracted during shock, and all the evidence supports this probability. It has been shown, however, that when shock is established the blood volume in actual circulation is reduced. The cause of this reduction is uncertain. Shock has been called by Cannon, "The problem of the lost blood." The practical surgeon knew that the blood was not in the splanchnic vessels, which are contracted under deep shock. There apparently existed a capillary stagnation; respiratory, motor and sensory disturbances were all accounted for by a low arterial pressure. Nervous causes, the influence of the absorption of toxic products, cold, internal secretions, anaesthesia, haemorrhage and sepsis, all might play their part in inducing this condition. With the great lowering of the blood pressure and the deficiency in the circulating blood a series of events occurred leading to derangement of the body metabolism and deficient oxygenation of the tissue, and this in turn increased the capillary stagnation. Treatment should follow well known lines. The patient must be kept warm. Intake of fluids may help to maintain the blood pressure. Sleep is all important, but morphine should be used carefully. Adrenalin, strychnine, alcohol, and pituitary extract are of little if any use. Glucose and sodium bicarbonate are of value if acidosis was present. Transfusion of blood gave the best results.

Pauchet, of Paris, said that the transfusion of pure blood was on physiological grounds superior to the transfusion of citrated blood, but the latter was easier to perform and could be more widely used. If blood was obtained from the donor in an atmosphere of oxygen, venous blood became transformed into arterial blood of which the action was especially efficacious. Blood, unlike saline, did not filter through the capillary walls. Pauchet thought that the reason why blood transfusion which in his opinion was the ideal treatment for shock, had not been more widely used was due to the lack of a systematic organization for its employment in every hospital. Every unit in a hospital, surgical, gynaecological and medical, ought to be provided with a special service for this purpose.

ON EXCESSIVE MAGNIFICATION OF SPORT IN A UNIVERSITY

THERE is a fine passage in the writings of the late Dr. Maudsley, in which he reflects on the breaking down of the mental powers. "It is not for the most part that brains wear out in old age"; he says, "many times they would go on longer if they were properly fed with energy from below, but the organic functions decay and fail; it is their failure which causes desire to wane and the grasshopper to be a burden; they are the sources of life's energy and relish, and in their integrity and vigour lies the secret of a fresh and active old age."

The preservation of these functions is ever before the mind of the teacher; it is on this principle that games have been developed and fostered so generously. But what if in the end there is no brain worthy of being fed? What if the care of the organic functions is allowed to encroach on the development of the mental powers? In other words, is a university training to aim chiefly at the nurture of the mind using games as an aid, or is the capacity to excel in games to become an end in itself, with the mind left unstocked and undeveloped. Perhaps that is stating the matter with exaggeration; perhaps even there is no such problem, and the real objects of the university are well enough understood by all students. But, then, what of the specialized training nowadays for such a game as football; the expensive coach, the rigid drilling in cryptic formations, the undeniable sacrifice of time supposedly belonging to the laboratory or classroom. Does this magnification of sport not enter into the life of the student footballer so much as to encroach on the intellectual side of his growth? Some idea of the intensity of the training is gained when we hear that it is necessary to arrange for special relaxations, such as theatres, to counter-balance its effects.

One may never fear that football or any other sport will become a primary object in a Canadian university, but one may observe with a jealous eye the indisputable growth of the part that sport is allowed to play in the life of the student who is fortunate enough, perhaps, to possess the gift of fine athletic powers.

ABRAM'S THEORY

ENQUIRY from a member of our Canadian Association as to the validity of Abram's claims for his "theory" and for his diagnostic and therapeutic machine has been received. The assertion is made by our correspondent that members of this Association are using these methods for the treatment of disease and are obtaining large fees thereby. If this be so, and if they have a conviction that the treatment is sound and of benefit to their patients we are of the opinion that reports of cases thoroughly investigated and proven should be given by them to this *Journal* for publication.

For our own part we have no first-hand knowledge of Abram's own writings and have nothing on which to base an opinion but the statements of lay writers in popular monthly magazines published in the United States. From these it would appear that Abram's theory is based upon the belief that all disease is predisposed to and grafted upon hereditary syphilis, which disease is common to all civilized mankind to whom it has been transmitted from the lower animals, *i.e.*, the calf, in the procedure of vaccination. Furthermore, it is stated that the blood of an individual has a certain electrical activity, even when old and dried and dead, and that with his machine, Abram, or those in possession of it, can diagnoses the presence and the severity of such diseases as syphilis, tuberculosis, cancer, etc.; and not only the severity expressed in percentages, but the actual location of the disease.

Naturally such assertions, contrary to all scientific and accepted belief, have deterred the serious minded from investigation, comment or criticism. But in fairness to our correspondent we cannot ignore his question nor his statement, and our opinion is expressed forthwith, "that the use of Abram's machine by members of the medical profession, other than for the purpose of investigation and experimentation, is unjustifiable and unethical; and that exploitation of the machine for personal and financial gain is gross quackery and fraud. We are open to correction and conviction, not from vituperative abuse and declarations in the lay press but from carefully prepared reports from members of our own Association, who consider themselves justified in the adoption of Abram's methods."

The Cult of Abrams and the Scientific American.—The “Electronic Reactions of Abrams” are being investigated by the *Scientific American*. While THE JOURNAL is still of the opinion, expressed several times, that the whole scheme is so preposterous a fake as to stand self-condemned, yet, there are, presumably, some people who demand demonstrable evidence of the fact that the moon is not, and never was, made of green cheese. A preliminary article regarding the investigation to be undertaken by the *Scientific American* appeared in the October, 1923, issue of that publication. The first test to determine the accuracy of the “Electronic Reactions” diagnosis is reported in detail by the managing editor of the *Scientific American* in the current (November) issue. It makes amusing reading. Six tubes of pure germ cultures were submitted to an Abrams disciple with the request that he identify the cultures. The first tube was a pure culture of typhoid. The Abramsite diagnosed it as “acquired syphilis, congenital syphilis, tuberculosis, gonorrhea, pneumococcus, malaria and influenza” but failed to diagnose typhoid. The second tube was a pure culture of pneumococcus. The “ERA” (“Electronic Reactions of Abrams”) gentleman diagnosed the contents of this tube as “congenital syphilis, tuberculosis, gonorrhea, malaria, influenza and colon septecemia” but did not find what it really was, pneumococcus. The fourth was a tube containing a pure culture of tetanus. It was diagnosed as “malaria, influenza, colon septecaemia and diphtheria,” but not tetanus. The sixth culture was of diphtheria. The Abrams wizard found “congenital syphilis, tuberculosis, gonorrhea, pneumococcus, malaria and colon septecemia.” And so it went. When the Abrams disciple found that he was falling down hopelessly he began casting around for excuses. Looking at the vials which he had already tested, he discovered for the first time that the labels had red edges and bore blue handwriting. This catastrophic chromatic combination, naturally, shot the “ERA” all to pieces. The disciple explained how, quite recently, he had obtained very unsatisfactory results all one morning to find later that the cause was due to his “subject” (the healthy individual whose abdomen is percussed) having a piece of red cardboard, a theatre seat check, in his trousers pocket. However, the *Scientific American's* committee removed the red bordered labels with the blue handwriting and substituted a set of plain labels prepared on the typewriter; but the diagnostic results were no more satisfactory than before. It may be said in closing that Albert Abrams has disowned the disciple who flunked the tests as not being a Simon Pure hundred percenter and has promised the *Scientific American* to give a personal demonstration “some time in the near future, if time permits.” The whole thing is very funny and very foolish.—*Jour. A. M. A.*, Oct. 27, 1923.

Editorial Comments

The Department of Health, in Ottawa, has printed a very useful pamphlet of 27 pp. on "Sanitation, with special reference to Sewage Treatment for isolated houses and small institutions where municipal sewage system is not available." The article is written by B. Evan Parry, M.R.A.I.C. It is clearly written, well illustrated, and will certainly prove of great usefulness to those who have to deal with the disposal of sewage in isolated houses throughout the country.

The "Endocrine Survey" has been received and purports to be a monthly review of progress in the study of endocrinology and organotherapy. The editor is Henry R. Harrower. It is emphasized that this journal is not connected with nor published by the Harrower Laboratories in California, but by a separate company.

We are receipt of a small pamphlet published by the Ontario Provincial Board of Health, containing information for physicians on "The use of insulin" and its method of administration, and naming the various depots at which it may be supplied free of expense, for use in patients who are unable to pay for the drug themselves. The pamphlet has been prepared by Dr. J. W. S. McCullough, Chief Officer of Health, and gives all the facts important for the physician to be acquainted with.

In a letter received from Messrs. Parke, Davis & Co. they call attention to the fact that in a recent Editorial the specific term "pituitrin" was employed when the intention of the writer was the inclusion, speaking generally of all extracts of the posterior pituitary gland. Messrs. Parke, Davis & Co. state that they have the exclusive right to the use of the name pituitrin for their preparation which is standardized by the employment of both pressor and oxytocic tests, and to prevent deterioration each package is dated. They claim that some of the untoward results reported in the press were not the result of their preparation, but of imperfectly standardized extracts made by other manufacturers. We desire to acknowledge that our use of the term "pituitrin" as including all pituitary extracts was unfortunate, and we regret if any slur whatever was cast upon the standardized preparation made by the well known firm in Detroit.

THE FREQUENCY OF CHLOROSIS

In the July issue of Guy's Hospital Reports, an article appears by Dr. J. M. Campbell, on the subject of "Chlorosis," which was at one time so prevalent in many civilized countries. This disease is stated to be rapidly disappearing under the greater amount of exercise and the more ready access to fresh air enjoyed by the young women of to-day. The percentage reduction in chlorosis as observed in Britain so far as figures can be collected is shown in the following table:—

Total British Figures of Chlorosis—Percentages

Year	*Percentage cases*	*Year*	*Percentage cases*
1898	6.6	1908	5.9
1899	5.4	1909	4.9
1900	5.6	1910	4.2
1901	6.7	1911	4.4
1902	8.0	1912	4.2
1903	8.5	1913	2.8
1904	6.8	1914	3.1
1905	6.5	1915	2.5
1906	5.1	1916	1.8
1907	5.5	1917	1.5

A similar decline in frequency has been observed in Sweden, in France and in America. Chlorosis is considered to be an exaggeration of a normal condition rather than a definite disease *sui generis* and the inference is perhaps justified that the general health of womanhood under this greater amount of exercise has gradually improved from about the beginning of the present century. It was about this time that the first insistent demands for an outdoor life and regular exercise for school girls and even adult women began to be made. Dr. Campbell does not favour the idea that improved feeding is the important factor in the improvement, but considers that it is chiefly due to the improved conditions of employment allowing more opportunity for fresh air and exercise. A physician writing in *The Times* makes the suggestion that the abolition of tight lacing in women has also had some influence in the general improvement.

BRITISH JOURNAL OF ANAESTHESIA

All those interested in anaesthesia should welcome this new quarterly journal called the *British Journal of Anaesthesia.*

The Editorial Board is composed of men of unquestionable ability and standing whose aims and objects on behalf of the practice of anaesthesia, as set forth in their *Foreword*, are the highest ethically and scientifically.

The first issue contains many interesting papers and abstracts, as well as much valuable information concerning the activities of anaesthetic societies. It is hoped that the future success of the *British Journal of Anaesthesia* will be made greater by the support of chemists, physiologists, pharmacologists, surgeons and anaesthetists.

At the International Physiological Congress in Paris Drs. E. Retterer and Voronoff read a paper on "The relation of physiological phenomena with the structure of the grafted testicles." A histological examination practised every month for nearly two years by Professor Retterer upon testicles grafted by Dr. Voronoff clearly proved that from the moment when the testicular cell at a certain age is transformed to a specific element, notwithstanding any morphological changes produced by its grafting on to a new site, that cell continued to possess the property of elaborating products of internal secretion which determine the physiological phenomena.—*Brit. Med. Journal*, August 4th.

WATER INTOXICATION

Dr. Leonard G. Rowntree, of Rochester, Minnesota, (*Brit. Med. Jour.*, Aug. 4) read a paper at the International Physiological Congress in Edinburgh, on Water Intoxication. He stated that in man and animals water ingested in excess of the excretory ability of the organism resulted in water intoxication. Water intoxication was manifested by restlessness, asthenia, polyuria with frequency of urination, diarrhoea, nausea and vomiting, muscular tremors and twitching, ataxia, and sometimes tonic and clonic convulsions followed by stupor and coma. The convulsions were general, extremely violent, and in the main resembled those of strychnine poisoning; they might recur at intervals of a few minutes. The condition terminated in death unless the excessive intake of water was stopped. As a rule these symptoms of water intoxication disappeared after the intravenous injection of hypertonic salt solution. The effect of the excessive administration of water on the blood had been studied in detail. Water had been given at half-hour intervals in amounts of 50 c.c. for each kilogram of body weight. The haemoglobin concentration was found to fall progressively. This loss might be as great as 25%, and was most rapid between the second and third hours after starting the experiment. It continued to increase slightly as long as the water was given, but returned to normal in from 12 to 24 hours after the ingestion of water was discontinued. There was also a decrease in the refractive index indicating a diminution of the protein per unit of the blood serum. The change in protein content was similar to that in the haemoglobin content of the blood. The salts in the blood serum were likewise decreased.

Men and Books

SIR CHARLES BELL

We note that an excellent oil painting of Sir Charles Bell, one of the most eminent surgeons and investigators of the early decades of last century, has been presented by Mr. A. E. Webb-Johnson, Dean, to the Medical School of the Middlesex Hospital, which Bell was largely instrumental in founding, in the year 1835. Sir Charles Bell, a graduate of the Edinburgh school, left that city in 1804, becoming surgeon to the Middlesex Hospital and retaining that office until 1836 when he returned to Edinburgh to occupy the chair of surgery in his own "alma mater." Sir Norman Moore, in his biography of Bell in the Dictionary of National Biographies, writes:—"Bell's discoveries were the greatest that had been made in physiology since Harvey demonstrated the circulation of the blood. His fundamental experiment is thus recorded by himself in the book he published in 1811, entitled *"A new idea of the anatomy of the brain."*:—"On laying bare the roots of the spinal nerves in an animal recently killed. I found I could cut across the posterior fasiculus of nerves, which took its origin from the posterior portion of the spinal marrow without convulsing the muscles of the back, but that on touching the muscles of L back, but that on touching the anterior fasiculus with the point of the knife, the muscles of the back were immediately convulsed. I now saw the meaning of the double connection of the nerves with the spinal marrow." In 1882 Magendie in France discovered the fact that irritation of the posterior roots caused pain. Sir Charles Sherrington has said of these Bell-Magendie experiments that their importance can hardly be overstated. They proved that the incoming channel was in one spinal root and the outgoing in the other. There can be no doubt that Bell had the priority. In a letter dated January 9th, 1826, Bell wrote of his discovery, "It shows that two nerves are necessary to every muscle, one to excite action, the other to convey the sense of that action, and that each impression runs only in one direction." Bell also established the fact that the spinal nerves had filaments of both kinds, sensory and motor, but the anterior roots, springing from the spinal cord, are always motor, and the posterior roots sensory. To the genius of a great philosopher Sir Charles Bell united the qualities of a noble minded man. His rare originality, his profound knowledge, his varied accomplishments, and his unremitting industry did not save him from long and anxious struggles, but he neither abated the cheerfulness which was habitual to him, nor surrendered one jot of his independence. Bell was born in 1774, and died of angina pectoris near Worcester on April 28, 1842.

CHARLES GABRIEL PRAVAZ

In the *British Medical Journal* of August 18th, a short sketch is given of the history of orthopaedics and of notable orthopaedic practitioners, with special reference to the work of the French orthopaedist Pravaz, best known to English surgeons as the inventor of the syringe with a hollow needle, which has since been known by his name.

Little attention was paid by surgeons and the profession generally to deformities and their treatment until Stromeyer in the early decades of last century directed attention to them. Shortly afterwards Shaw and Harrison in England did pioneer work in the treatment of club foot. A notable person about that date was Sheldrake who was consulted by Byron. In *The Lancet* of 1828-29 there are numerous communications from this gentleman with a commendatory note from the editor, Mr. Wakley, but reading them at this date one fails to gather from his verbose communications, what measures he employed to achieve the cures of club foot of which he boasted. Sheldrake had no legal qualifications, and despite the sponsorship of the editor of *The Lancet* we fear his methods were those of a quack.

Pravaz was a very different personage. Born in 1791 in the south-west of France he graduated at the University of Paris in 1824. Connected by marriage with the proprietress of a girls' school, he had his attention directed to the treatment of scoliosis. Ultimately the girls' school became an orthopaedic institution. In 1827 he published a book under the title of *Methode nouvelle pour le traitement des deviations de la colonne vertebrale*, which was favourably reported on by the Academy of Medicine in 1829. In it he described his progressive extension bed which figured later in his treatment of congenital dislocation of the hip. The advance that he made in the treatment of this deformity gives him a just claim to our recognition of him as a thoughtful and clever orthopaedic surgeon. Pravaz appears to have seized on some of the important principles by which congenital dislocation of the hip can be cured. He relied chiefly on long continued extension with weights, which in some cases amounted to more than forty pounds; after which the dislocation was reduced by abduction and pressure, and maintained in the abducted position by means of a belt. Pravas also realized thoroughly the necessity of reforming the articulation. He had not the advantages obtainable by the use of plaster of Paris, the value of which had only begun to be recognized by Bouvier in the treatment of club feet. There can be no doubt of the functional value of his results in many cases, and his patients were immensely benefitted thereby. When Pravaz died his success was still disputed in Paris. It was unfortunate that his orthopaedic institute in the later years of his life had been moved to Lyons . He probably would have won greater appreciation for his work had his institute remained in or near Paris. Bouvier was at that time regarded as a great authority. Jealous of Pravaz, he used his influence against his methods. This, and the long time required by Pravaz's treatment, tended to throw the latter into disrepute, and probably retarded progress for forty years, until Pacci rediscovered the principles of Pravaz and Lorenz added to them and improved their application by using plaster of Paris. Looking back on the past it appears to us a tragedy that nearly two generations of hip-luxated cripples should have been deprived of benefits such as they might have enjoyed had the work of Pravaz been carried on.

Four Deaths Caused by Sodium Fluorid.—The amount of sodium fluorid varies from 16 to 63.6 per cent. in insecticide powders. Sodium fluorid has not been regarded as a poison, but William D. McNally, Chicago, is of the opinion that it is time that manufacturers and dispensers of insecticides label their products "Poison," and inform the public that the insecticides contain certain substances capable of causing death or seriously affecting the health of the individual when it is taken by mistake for a baking powder or a laxative. Three accidental deaths and one suicide are reported by McNally. The chief symptoms are burning in the stomach and bowel, muscular paralysis, vomiting and diarrhoea, and failure of the heart and respiration. Salivation was noted in only one case, while convulsions were not noted in any case. In suspected cases of poisoning, the soluble sodium salt may be rendered inert by conversion to the insoluble calcium fluorid by copious and repeated gastric lavage with lime water or a weak solution of calcium chlorid. Many mistakes in the future could be obviated if all insecticides were colored with 10 per cent. lamp black or other coloring matter.—*Jour. A. M. A.*, Sept. 8, 1923.

Post-traumatic Bone Tumors.—As far as he has seached the literature, S. D. Foster, Toledo, Ohio, says there is no experimental proof that injury has caused bone tumors. Some writers think there is an underlying constitutional factor, which with the trauma, causes bone tumors. During the war work many cases of bone tumors were reported, following injury, either with or without infection; but most of these war wounds were infected from the onset. The greatest task in this study is in the line of diagnosis. In view of the high mortality of sarcoma, especially as to its final results, it would seem advisable to take some extra time to make sure of the diagnosis. It would be better to save a limb in a benign case, even with the slight added danger from the time taken to make this diagnosis as complete as possible.—*Jour. A. M. A.*, Sept. 8, 1923.

Abstracts from Current Literature

MEDICINE

Researches on the Pupillary Reactions in Epidemic Encephalitis.

Mehrtens, H. G., and Barkan, O. *Arch. of Neurol. and Psychiatry,* October, 1923.

The writers point out that the Argyll-Robertson pupil has been reported in conditions other than neuro-syphilis, e.g., chronic alcoholism, injuries and mid-brain tumours. It is also said to occur in epidemic encephalitis, but on examining reports in detail it appears that the original definition of the sign is not always followed very closely. The light reflex, for example, is sometimes spoken of as "absent" or "sluggish," whereas Argyll-Robertson's description was that the pupil was "insensible to light but contracted still further during the act of accommodation for near objects." It is contended that even though incipient or incomplete forms may be indicated by such terms as "partially lost" or "obviously diminished" light reflex, the use of these terms allows of inaccurate or obscure descriptions.

Thirty-six cases of epidemic encephalitis in all of whom the Wassermann reaction had been shown to be quite negative, were examined, special methods being used to measure both the light reflex and the accommodative power. The Argyll-Robertson pupil was found in no instance: where there was a sluggish light reflex there was usually also some impairment either of the power of convergence or accommodation. Eighty per cent. of the series showed varying degrees of paresis of the ciliary muscle, a point which was much emphasized in the discussion of the paper.

According to the statements of experienced observers who discussed this paper, it is indisputable that the Argyll-Robertson pupil has been noted in epidemic encephalitis, for, as was explained, it is not the pathologic nature of the lesion that matters so much as the region involved. The sign occurs frequently in syphilis because the syphilitic virus has a specific sensory affinity, attacking in particular the proto-neuronic terminations of the visual apparatus, hence causing paralysis of the light reflex and not of accommodation. But in epidemic encephalitis a variety of changes may be found, the Argyll-Robertson pupil, or its reverse, or paralysis of both light and accommodative reflexes. H. E. M.

The Quinine Test in Hyperthyroidism—Second Report.

Bram, I. *New York Medical Journal and Medical Record,* September 19th, 1923.

This test is based on the observation that thyrotoxic patients show marked tolerance towards quinine. The writer emphasizes its simplicity and accuracy as compared with the Goetsch and basal metabolism tests. The former shows far too large a margin of error, and, he thinks, may not always be in the best interests of the patient. He admits the value of the basal metabolism test as an indicator of thyroid hyperactivity, but comments at some length and with much asperity on the possible sources of error in carrying it out. His work on the quinine test was first published in 1920, when he gave the results in a series of 160 cases. The present report covers a further 300 cases, with some controls.

The test is carried out by the administration of ten-grain capsules of quinine hydrobromide, given an hour after meals with plenty of water. It may be necessary to give some gastric sedatives with the quinine. In the normal or hypersensitive individual signs of intolerance will appear after one or two capsules. In the case of a hyperactive thyroid no symptoms of intolerance appear even with long periods of administration; there may indeed be much improvement in the hyperthyroidism.

According to the author the margin of error in this test is small because it depends only on those few who are naturally insusceptible to the drug; care must be taken to eliminate the cases which show increased tolerance due to such conditions as malaria, pneumonia, acute tonsillitis, etc., which, in any case, is a temporary tolerance only. He concludes that the test confirms the diagnosis of hyperthyroidism, but does not distinguish between toxic adenoma and Graves' disease. It is of aid in ruling out such conditions as simple non-toxic goitre, incipient tuberculosis, hysteria, paroxysmal tachycardia and diabetes mellitus. H. E. M.

Metastasis in Mumps.

Brit Med. Journal, May 5th, 1923.

At a meeting of the Brighton and Sussex Medico-Chirurgical Society, Mr. George Morgan read a paper on "Metastasis in Mumps." He gave details of the illness of a boy aged fourteen who, during an epidemic of mumps at his school, developed parotitis on the right side followed by arthritis of the right knee, delirium, and urticaria. Subsequently he had an acute pericarditis, with endocarditis; and his urine boiled almost solid although no casts were found. Symptoms of mitral regurgitation followed, and a right sided pleurisy, with a morbilliform rash, pain and swelling of the right ankle, and an enlarged gland in the right axilla. Jaundice afterwards supervened, with a temperature and pulse rate continuously high, the pericardial friction and the regurgitant mitral murmur still being manifest. Severe pain and tenderness over the abdomen suggested the possibility of an acute pancreatitis. Blood cultures were sterile. After a prolonged convalescence the boy made a good recovery. Mr. Morgan also quoted the case of a man who, while playing billiards was accidentally struck by the cue on the left testicle. The organ rapidly swelled up, became painful and tender, and a few days later the left parotid enlarged and the swelling of the testis slowly subsided. Shortly afterwards symptoms of a meningeal infection developed with severe headache, vomiting and photophobia. He ultimately made a good recovery. Mr. Morgan thought that the virus of mumps was in the blood at the time. The injury caused it to attack the testicle before the parotid.

SURGERY

The End Results of Surgery of the Thyroid Gland.

Pemberton, John de J. *Archives of Surgery*, July, 1923. Vol. vii, p. 37.

In recent years there has been great improvement in the immediate and end results of surgery of the thyroid gland. During the year 1922, in the Mayo clinic, 1,983 operations were performed on 1,497 patients with goitre. Nineteen patients died, a mortality by operation of 0.95%. In the earlier days of thyroid surgery the relatively high mortality rate was an influential factor in deciding many suffering patients to seek means other than surgery for cure. Many of these finally came to surgery at a late stage in the course of the disease when the operative risk was greatly increased. To-day, a much larger proportion of patients with goitre are operated upon early in the course of the disease. With a better recognition of the dangers associated with the surgical management, together with increased knowledge of the thyroid gland in health and disease, and the practical application of basal metabolism, the immediate and end results following operation are now comparable with those of any major surgical procedure.

The diseases of the thyroid gland amenable to surgery may be grouped under six headings, first diffuse colloid thyroid, second, adenoma without symptoms of hyperthyroidism; third, adenoma with hyperthyroidism; fourth, exophthalmic goitre; fifth, thyroiditis; and sixth, malignancy.

First, diffuse colloid goitre is a physiological enlargement of the gland occurring in adolescence, due to iodine insufficiency in the blood, and cured by the administration of iodine or thyroxin. Unless colloid goitre is associated with adenoma or by its size causes pressure or disfigurement, operation is not indicated. In cases in which operation is advisable the operative risk is less than one per cent. and the end results are good.

Second, adenoma without hyperthyroidism should be treated surgically, partly for cosmetic purposes and for the relief of pressure symptoms, and partly because a certain proportion of patients subsequently develop hyperthyroidism. Treatment other than operative is ineffective. The operative risk is less than 0.5%; in nearly 100% of cases successful operation results in complete cure. The very infrequent recurrence of symptoms may be attributed in nearly every instance to failure in removing all of the adenomatous tissue.

Third, if a patient with adenoma develops hyperthyroidism the onset is usually insidious, and only mildly progressive. Patients do not appreciate any great change in their condition until symptoms of marked cardiac irregularity or of decompensation develop. As a consequence visceral degenerative changes often develop adding considerably to the operative risk and diminishing the prospect of complete cure. The operative mortality is between two and four per cent. In from ten days to two weeks after the successful removal of the adenomatous tissue the hyperthyroidism has completely disappeared. After the lapse of two years, Judd found that about 83% of the patients operated upon considered themselves quite cured, and five per cent. more were markedly improved.

Fourth, in exophthalmic goitre the lowering of the operative mortality is due to an increased knowledge of the disease and of the dangers incident to surgery, and to the fact that such patients resort earlier to operation, before the development of visceral changes. In analysing the data obtained by mailing a questionnaire to each of 482 patients successfully operated upon during the year 1916, it was found that 315 of the 349 patients regarding whom replies were obtained, were living (90%); 34 (10%) had died from various causes. Of these 315, 188 (54%) considered themselves cured, their replies indicated that they no longer suffered from symptoms suggesting hyperthyroidism. In many of these, however, some amount of exophthalmos persisted. Eighteen (9.5%) had shown some evidence of recurrence, but were emphatic now in their statement that they are well. Thirty-six patients (19%) have still some swelling of the neck, which has persisted since operation. Eighty-eight patients (25.5%) are reported as greatly improved and able to carry on normal duties. Twenty-eight patients while improved have evidence of persistent or recurrent hyperthyroidism or of its residual effects. Nine only (3%) regarded themselves unimproved. Lack of improvement was attributed to, first, incompleteness of operation; second, the long duration of hyperthyroidism before operation; and third, failure to eliminate at the operation all foci of infection.

Fifth, thyroiditis is rare, and surgery is indicated only in tuberculous and suppurative types.

Sixth, malignancy occurs as sarcoma, carcinoma, malignant adenoma, and malignant papilloma, in the ratio of one malignant case in fifty-seven. The prospect of cure by operation and intensive radium and Roentgen ray treatment varies with the type of malignancy.

F. J. Tees

Intra-abdominal Adhesions. Deaver, John B. *Surgery, Gynaecolopy and Obstetrics*, October, 1923. Page, 506.

The application of the X-ray examination of the air containing abdomen has cleared up many cases of obscure diagnosis by showing the presence of adhesions, sometimes not suspected. These may be inflammatory or post-operative. The former are frequently protective, and temporary; later on being absorbed. Operative drains produce similar local inflammatory adhesions, which usually disappear. Adhesions are an indication of peritoneal injury by infection or trauma. Destructive adhesions occur chiefly in the right upper quadrant, involving the duodenum, gall bladder and colon. They often result in chronic stasis and partial obstruction. Free blood left in the abdomen ; sutures, ligatures, and gauze swabs ; friction and rough handling, and the use of chemical hand solutions favor the formation of adhesions. The hand stained with iodine leaves a trail of adhesions on its withdrawal. Proper operative technique; abstention from exposure of the intestines uncovered to the air; careful handling; absence of antiseptics; and perfect asepsis will do more than any local application to prevent adhesions. Viable omental grafts are better than anything to prevent adhesions to raw peritoneal-free surfaces. They are applicable to cover perforations, enterorrhaphy suture lines and to cover stumps. Post-operative purgation increases trauma by rendering the intestinal mucosa more permeable to toxins and bacteria. Gymnastic exercises, massage, hydrotherapy and open air life will often induce freedom from symptoms, if not the actual disappearance of abdominal adhesions.

Chas. K. P. Henry

Citrate versus Unmodified Blood Transfusion. Lederer, Max, M.D. *Surgery Gynaecology* and *Obstetrics*, August, 1923, page 221.

Reactions following transfusion have been the subject of much investigation and discussion. Although many explanations have been offered for their occurrence, no one explanation has been found satisfactory in every instance. It is the writer's purpose to present the results derived from a study of forty consecutive cases transfused by the citrate method as compared with forty cases transfused with unmodified blood, this second series immediately following the first. Those transfused by the first method were followed in a large percentage, (23 cases, 49.5%), by reactions more or less severe. In many of these reactions there were severe chills, cyanosis, rapid pulse, and elevated temperature; in one case as high as 107° F.; although the average was only 102° to 103°. In the forty cases in which unmodified blood was transfused, forty-nine transfusions were given without any reaction occurring. The nearest approach to these results were obtained by Lindeman who reports 214 transfusions by syringe method without any chill occurring. Lindeman's cases, however, were followed by rises in temperature and other symptoms. In our cases there was complete freedom from any untoward symptoms. To offer an explanation for this absence of reaction is not easy. The perfection of the technique employed in the citrate transfusions compared favourably with that used in the unmodified method. In the writer's series of forty cases the donors were cross tested with the patient. Reliance was placed upon the direct admixture of the blood of the donor as the criterion of selection, ("mutual testing") rather than upon the identification of the group of the recipient and transfusion from an homologous donor. This method of testing is based upon that originally described by Rous Payton. Each one of the four donors is tested with that of the recipient; the blood is allowed to stand at room temperature for ten minutes and is then examined on a slide with a cover glass under the microscope, at the end of which time agglutination, if present, can be detected quickly and easily. In none of the series reported was the transfusion followed by any symptom referable to incompatibility. Two cases in females showed auto-agglutination of the patient's washed red blood cells, resulting in severe anaemia. They were cured by transfusion from a group four donor. Both the series of transfusions here compared were performed by means of one of the Miller instruments, first with the shuttle, more recently with the valve. The valve is the simplest and most consistent instrument for the purpose. When using it but one assistant is needed with very little paraphernalia; a transfusion of 500 c.c. can be completed easily in ten minutes.

The transfusions were carried out upon the usual class of cases, post-haemorrhagic, pathological anaemias, and sepsis. The most satisfactory results were obtained in cases of haemorrhage which include those of obstetrical, post-operative, and haemophiliac origin. In the group of the anaemias, while the statistics are favourable, they are not so favourable as in the first group. In the twenty-six cases of sepsis only four showed improvement. The difficulty of whole blood transfusion in desperately ill cases, when movement of the patient to the operating table was contra-indicated, is noted, and in some cases reported, was overcome by bedside transfusion. The writer quotes Mellon's suggestion of the possiblity of the reactions in citrate transfusion being due to the varying chemical reaction of commercial sodium citrate.

Chas. K. P. Henry

ANAESTHESIA AND ANAESTHETICS

Morphine, Hyoscine Hydrobromide Seminarcosis Preceding Operation. A report of one hundred cases with fifty checks. O'Keefe Chas. D. *The Journal of the Missouri State Medical Association*, April, 1923. Page 126.

The principal advantage of this method is the abolition of the period of anxiety and unrest immediately before the operation. It may even render the administration of a general anaesthetic unnecessary in minor operations such as the application of radium, removal of cervical polypi, dilatation of the cervical canal, etc. When a general anaesthetic is given much less is required. The induction is quicker and the convalescence smoother. One of three different techniques was used by the writer, according to the case. (1) Morphia, gr. ¼ and hyoscine hydrobromide, gr. 1/130 (1 cc.) given one hour and forty-five minutes before the time of operation, the hyoscine being repeated in forty-five minutes. (2) Same as 1, except that 1/6 of a grain of morphia instead of gr. ¼. (3) Same as 2, except that a third injection of hyoscine was given fifteen minutes before the time of the operation. Everything is done after the first injection to induce sleep by keeping the patient perfectly quiet and undisturbed. In technique No. 1, the dose of morphine (gr. ¼) was found to be too large for undersized delicate women as it caused marked slowing of respiration and cyanosis. The choice of the technique depends upon the individual case. The best results are obtained with the use of a third injection of hyoscine and cases where an anaesthetic was not used. There is an undesirable period of restlessness immediately following the operation in some cases, being most pronounced in those patients who received three injections of hyoscine.

W. B. Howell

Ethyl Chloride as an Anaesthetic for Minor Operations in Children. Rose, S. F. *The Lancet*, June 23rd, 1923. Page 1258.

The writer has administered ethyl chloride to children for dental operations 15,000 times without a fatality. His patients have varied in age from eighteen months to fourteen years. His experience has been limited to cases where the mask had to be removed to allow the operator to work. He has no experience of anaesthesia maintained after the patient has once been put fully under. He has often given second or third doses when the first did not suffice. He has a closed bag and mask. Anaesthesia lasts from twenty to thirty seconds after removal of the face piece. Two to five c.cm. of ethyl chloride are used. Most of the cases were given with the patient in the sitting position. Special emphasis is laid on the importance of excluding all air from entering between the face and the mask. Occasionally syncopal attacks occur. They are indicated by bluish pallor of the face. The anaesthetic must be stopped and the patient inverted. Obstructed respiration sometimes occurs, but this can be dealt with in the usual way. W. B. HOWELL

PAEDIATRICS

Acute Secondary Anaemia in Infancy. Lucas, W. P., and Hoobler, H. R., *San Francisco. Trans. Amer. Ped. Society*, 1923.

The authors have grouped acute anaemias under four headings: (1) Mechanical loss of blood; (2) haemoglobin deficiency; (3) destruction of bone marrow; (4) combined blood cell and bone marrow destruction.

In the first group the predominating picture is that of regeneration which becomes evident as early as fifteen minutes after the haemorrhage. There is marked stimulation of the bone marrow and if proper dietary factors are supplied regeneration will be very rapid. The second group caused by deficiency in haemoglobin is a very large group, commonly found in premature infants, in twins, and in infants of anaemic mothers. In all of these infants there is a definite lack of iron deposited during foetal life. There is a marked reduction in haemoglobin out of proportion to the reduction of the red cells.

The third group depends on destruction of bone-marrow. The processes of destruction are going on more rapidly than those of regeneration. The blood picture shows a very low percentage of haemoglobin and a relatively low red cell count. A prominent feature is the marked reduction in the platelets. Extreme cases of this type are termed idiopathic aplastic anaemia.

The fourth group is that in which the blood picture and bone-marrow give a complex picture of blood destruction. There are signs of both degeneration and regeneration in the blood picture and evidence of marked activity in the bone-marrow. This is the picture of acute anaemia often found with acute pyogenic infections. Blood transfusions are of more benefit in this type than any other method of treatment. Frequent transfusions of small amounts (30 to 60 c.c.) have been found most efficacious.

L. M. LINDSAY

A Study of Pertussis in a Hospital. Herrman, Charles and Bell, Thomas. *Arch. Pediat.*, July, 1923.

Every case of spasmodic cough is not pertussis. The Bordet-Gengou bacillus is regularly present in the catarrhal stage of every true case. The contagion is usually not communicable after the fourth week. Bronchopneumonia was the most frequent complication. The principal aids in the early diagnosis are the presence of a relative and absolute lymphocytosis in the blood; the presence of the Bordet-Gengou bacillus in the sputum and a positive complement fixation test. Cutaneous tests did not prove of any value. Prognosis depends on the age of the child and the presence of any pulmonary complications. Pertussis is difficult to control because it is most communicable in the catarrhal stage when its true nature is not recognized.

The patient should be kept in bed in the open air. This conserves his strength and nutrition. Phenazone fortified by bromides was found to control the cough better than any other remedy. Pertussis vaccine has a specific effect in about one-fourth of the cases. Failure in this respect may be due to the presence of a different strain of bacillus. It is therefore better to have an autogenous vaccine prepared when the disease occurs in an institution for infants or young children. Our only hope for the control of whooping cough is a more perfect method of protective immunization. L. M. LINDSAY

A Study of Hilum Enlargement in a Group of Tuberculous Children. Anderson, Edward Dyer. *Jour. A.M.A.*, October 6th, 1923.

The clinical problem of the diagnosis of enlarged hilum or tracheo-bronchial nodes in children, presumably due to tuberculous infection, has occupied the attention of many observers and particularly of those interested in the maladies of children, since the publication of D'Espine's work in 1889. More recently there has arisen some discussion as to the interpretation of the sign described by D'Espine, and of other associated clinical phenomena.

Morse, in an article concerning this question (Am. Jour. Dis. Children, Nov., 1922) gives a description of his efforts to achieve a correct interpretation of this sign and says, "the sign to which D'Espine originally called attention is a whispering sound following the spoken voice heard over spinous processes, below the seventh cervical or first dorsal below which no such sound is heard normally." To verify this point, Morse examined one hundred and eighteen children in whom he suspected the presence of enlarged tracheo bronchial glands with a view to determine at what point the spoken and whispered voice and the breath sounds change from bronchial to vesicular and the possible presence of D'Espine's sign and of interscapular dulness; Morse concludes that a whispered sound after the spoken voice below the first dorsal, D'Espine's sign, is probably abnormal; that the bronchial sound of the voice and breath do not extend normally below the seventh cervical spire, and that continuation of these sounds below this level is definitely pathological and has the same significance as a positive D'Espine's sign. This latter is often the earliest abnormality; interscapular dulness being a late sign found only when there is extensive pathological change.

More recently Anderson, in an address before the American Medical Association concerning these signs, expresses great dissatisfaction with present methods of determining presence or absence of hilum gland enlargement. He examined ninety proven tuberculous children by the X-ray and the fluoroscope, and physical methods, and found such a marked discrepancy in figures, that is, children with enlarged glands by X-ray gave no auscultatory signs and those with some auscultatory signs were negative to X-ray, that he concludes that the presence of the accepted signs is not always indicative of enlargement of the glands. He finds that D'Espine's sign as described above, is difficult to elicit and is no more accurate than the level at which the bronchial character of whispered voice changes to vesicular. Also that this sign is often present when no enlargement of the nodes can be demonstrated by X-ray or fluoroscope. Anderson also finds the fixing of the seventh cervical spine as the point where the character of the voice changes, too high for the limit of normalcy for children of school age.

DERMATOLOGY

Match and Match-Box Dermatitis. Foerster, O. H. *J.A.M.A.*, October 6th, 1923.

A new variety of dermatitis is here described, with phosphorus sesquisulphide (P4S3) as the cause. This substance has entered into the composition of "strike anywhere" matches since 1914. White phosphorus has not been used in the manufacture of matches for a decade owing to the danger to operatives.

"Safety" matches have no effect on the skin as potassium chlorate is their chief ingredient. The box carrying safety matches, however, contains the sesquisulphide of phosphorus as a "strike" and is a skin irritant.

Seven cases are quoted where dermatitis was traced to matches or match boxes. When these were near or in contact with the skin, and when subjected to special conditions of heat and moisture, they developed irritant properties. In the above cases the matches or boxes were carried in the trousers' pocket and the dermatitis was situated on the thigh in each case. The abdomen was affected through the vest pocket in one case, and in another the face, eyes and ears developed a dermatitis carried apparently by the fingers.

By carrying a match box for three days in humid weather in his trousers' pocket the writer set up a dermatitis. The features of the disease are a preliminary pruritus, then an erythemato-papular eruption of varying intensity in contact with the pockets, followed the production of exudative, scaly, crusted, and later, lichenized lesions. Burning and painful sensations are often present in cases with only a mild inflammatory type of eruption. Recurring blepharo-conjunctivitis and facial dermatitis should lead one to look to matches as a possible cause.

The difficulties in diagnosis are shown by the fact that one of the cases had been mistaken for erysipelas and for chronic eczema of various types.

The treatment consists in the application of simple ointments and the strict avoidance of contact with matches for many months after the dermatitis has subsided. C. R. B.

The Importance of Blood Chemistry in Dermatology. Pulay, Edwin., *Arch. Derm. and Syph.*, August, 1923. Vol. 8, No. 2. p. 175.

Blood chemistry presents a new angle for the study of the pathogenesis of dermatoses. Therapeusis of skin diseases should be influenced by the results of these investigations. This paper refers to those of most practical importance, pruritus, eczema, and urticaria. Pruritus where universal, has in most cases an underlying disturbance of metabolism. Several groups are recognized, (1) uratic, including those of gastro-intestinal causation, with faulty purin metabolism as the final cause; alkali medication and cinchophen are advised. (2) Vagotonic pruritus with hyperglycaemia as the cause of the vagus irritability. This is treated by atropine and diabetic measures. (3) Impaired function of the kidneys accompanied the third group; blood analysis shows increase of chloride and residual nitrogen. The author considers pruritus frequently the first symptom of faulty kidney function. Diuretics (theophyllin) and Krell's milk treatment are recommended. (4) The neurogenous group point to a vegetative neurosis, with increase of calcium and hyperglycaemia. Disturbance of metabolism is considered the cause of eczematosis, a disposition of the skin to respond to eczematogenous irritation. Eczema is put down as a definite disease picture within this group. Eczematogenous irritations may be endogenous or exogenous. The latter require well recognized local treatment; general dietetic and internal medication (atropine and cinchophen) are recommended for the endogenous irritations, consideration is given to the effect of light on eczematosis in the hyperglycaemic cases. Sugar is one of the substances promoting a pronounced susceptibility to light.

Urticaria is attributed to metabolic changes marked by uricaemia, cholesterinaemia and chloraemia; most of the cases are associated with acid intoxication, suggesting treatment with alkali. Atropine is recommended, and as an antiphlogistic, cinchophen is considered valuable. A further group is attributed to sepsis, the result of tonsillar or renal mischief. Here the characteristic wheals are replaced by erythema.

The author would explain physico-chemically pruritus, oedema, exudation, (wheal formation, infiltration) by the change in the chemical condition of the cell, causing a disturbance of the balance of the ions and of osmotic pressure with resulting swelling. C. R. B.

A Condition Simulating Dislocation of the Head of the Femur.—R. Voigt (*Deut. med. Woch.*, June 8th, 1923, p. 761) confesses to a mistake which is liable to have serious consequences for the patient. It is the diagnosis of a sciatic dislocation of the head of the femur when the signs and symptoms are actually due to detachment of a fragment of bone from the upper margin of the acetabulum, the detached bone being driven into the joint. The case illustrating this accident was that of a middle-aged workman who, while he was stooping down on the railway line, was struck violently over the left hip by a railway carriage. He fell and could not get up again without help. Examination in hospital a few hours later showed great swelling of the left hip and thigh. The limb was flexed and adducted, being fixed in a position of internal rotation. The end of the great trochanter was approximately in Nélaton's line, and there was no shortening of the left leg. A sciatic dislocation was diagnosed, and the fact that the head of the femur could not be felt in the position it was supposed to occupy was explained away on the assumption that the great swelling of the affected parts masked the new position of the bone. When, however, attempts were made to reduce the hypothetical dislocation, slight crepitation was detected. An x-ray examination revealed the true state of affairs. Had not the crepitation been detected serious injury might have been inflicted.—*Brit. Med. Jour.*, Aug. 4, 1923

Therapeutic value of Transuterine Gas Inflation.—The cases of relief from dysmenorrhea following gas inflation, Reuben Peterson and Roland S. Cron, Ann Arbor, Mich., believe have been too few to warrant the drawing of any conclusions; but the relief has been so marked following the gas inflation that the authors are using it deliberately for the relief of this symptom alone. From hundreds of cases of transuterine gas inflation, they are convinced that the method is without danger, if certain precautions are taken in the selection of cases. It is a far simpler procedure than uterine dilation or the insertion of a uterine stem. The authors are using it constantly in the office as well as in the clinic.—*Jour. A. M. A.*, Sept. 22, 1923.

News Items

GENERAL NEWS

ONTARIO AND QUEBEC SECTION OF AMERICAN COLLEGE OF SURGEONS

MEETING AT OTTAWA, NOVEMBER 22nd, 1923

PROGRAMME

Registration and Information, Chateau Laurier

HOSPITAL CLINICS

8.00 A.M.—12.00 Noon (See Daily Bulletin)

11.00 A.M.—12 Noon

Clinical Address, Carleton County Protestant General Hospital

End Results in Abdominal Surgery.—Dr. George W. Crile, Professor of Surgery, Western Reserve University, Chief Surgeon to Lakeside Hospital, Cleveland, Ohio.

12.30 Noon—1.30 P.M.

Luncheon—Chateau Laurier

Address of Welcome by His Worship, Mayor Plant of Ottawa.

2.00 P.M.—4.30 P.M.

Hospital Conference, Ball Room, Chateau Laurier
Dr. A. T. Shillington, presiding

The Hospital Standardization Programme of the American College of Surgeons.—Franklin H. Martin, M.D., Chicago; Director-General, American College of Surgeons.

Hospital Standardization as a Factor for Better Surgery. W. W. Chipman, M.D., Montreal; Professor of Gynaecology and Obstetrics, McGill University; Chief Gynaecologist and Obstetrician Royal Victoria and Montreal Maternity Hospitals.

Hospital Standardization as a Factor for Better Hospital Administration.—A. K. Haywood, M.D., Montreal; Superintendent, Montreal General Hospital. D. M. Robertson, M.D., Superintendant Carleton County Protestant General Hospital, Ottawa.

Essentials for a Successful Staff Conference.—D. A. Craig, M.D., Chicago; Associate Director, American College of Surgeons—State and Provincial Activities.

An Adequate Pathological Service for the Hospital.—Oscar Klotz, M.D., Toronto; Professor of Pathology, Toronto University.

Fundamental Principles Underlying the Programme of Hospital Standardization.—Rev. C. B. Moulinier, S. J., President Catholic Hospital Association.

The 1923 Survey and Plans for the Future.—M. T. MacEachern, M.D., Chicago; Associate Director, American College of Surgeons—Hospital Activities, President American Hospital Association.

ROUND TABLE CONFERENCE

Conducted by M. T. MacEachern, M.D., Chicago

Discussion led by W. H. Delaney, M.D., Quebec, Que.; W. L. Ritchie, M.D., Ottawa, Ont.; George Ramsey, M.D., London, Ont.; Frederick B. Mowbray, M.D., Hamilton, Ont.; C. B. Keenan, M.D., Montreal, Que.; Roscoe R. Graham, M.D., Toronto, Ont.; C. E. O'Connor, M.D., Kingston, Ont.

4.30 P.M.—5.00 P.M.

(*a*) Activities of the American College of Surgeons (Illustrated).
(*b*) Election of Officers: Executive Committees Ontario and Quebec.

8.00 P.M.—10.00 P.M.

Community Health Meeting, Ottawa Collegiate Institute, Lisgar Street, Under the Patronage and in the presence of Their Excellencies, the Governor General and Lady Byng, of Vimy.
A. D. Shillington, M.D., presiding

The Programme of the American College of Surgeons.—Franklin H. Martin, M.D., Chicago; Director General, American College of Surgeons.

Conservation of Maternal and Child Life and Better Care for the Prospective Mother.—W. W. Chipman, M.D., Professor of Gynaecology and Obstetrics, McGill University, Chief Gynaecologist and Obstetrician, Royal Victoria and Montreal General Hospital.

What Scientific Medicine has done for the World.—George W. Crile, M.D., Professor of Surgery, Western Reserve University; Chief Surgeon to Lakeside Hospital, Cleveland.

The American College of Surgeons and Better Hospitals. —M. T. MacEachern, M.D., Associate Director, American College of Surgeons—Hospital Activities; Director-General, Victorian Order of Nurses for Canada.

Our People, our Hospitals and our Profession.—Rev. C. B. Moulinier, S.J., President Catholic Hospital Association.

The American College of Surgeons as a Factor in Public Health.—D. A. Craig, M.D., Associate Director, American College of Surgeons—State and Provincial Activities.

Health Film—"The Reward of Courage."

GOD SAVE THE KING

NOVEMBER 23rd, 1923

HOSPITAL CLINICS

8.00 A.M.—11.00 A.M. (See Daily Bulletin)

11.00 A.M.—12.00 Noon

Clinical Address, Ottawa General Hospital.—W. W. Chipman, M.D., Professor of Gynaecology and Obstetrics, McGill University.

(*a*) Diagnosis and Treatment of Ectopic Gestation
(*b*) Uterine Haemorrhage, its Significance and Treatment.

Clinical Address, St. Luke's Hospital,
F. N. G. Starr, M.D., Associate Professor of Clinical Surgery, Toronto University—Some of the Problems of the Right Iliac Fossa.

12.00 Noon—1.00 P.M.

Lucheon at Carleton County Protestant General, Ottawa General and St. Luke's Hospitals

2.00 P.M.—5.00 P.M.

Scientific Session, Ballroom, Chateau Laurier

Renal Tuberculosis.—L. J. Austin, M.D., Professor of Surgery, Queen's University.

The Bad Risk Patient with Special Reference to Abdominal and Thyroid Operations.—George W. Crile, M.D., Professor of Surgery, Western Reserve University; Chief Surgeon to Lakeside Hospital, Cleveland.

The Management of Labour in Contracted Pelves.—W. W. Chipman, M.D., Professor of Gynaecology and Obstetrics, McGill University; Chief Gynaecologist and Obstetrician, Royal Victoria and Montreal Maternity Hospitals, Montreal.

The Surgeon and the Student.—Oscar Klotz, M.D., Professor of Pathology, Toronto University, Toronto.

Address (subject to be announced later).—George D. Stewart, M.D., Professor of Surgery, University and Bellevue Hospital Medical College, New York City.

Address (subject to be announced later).—Sir Henry Gray, Chief Surgeon to Royal Victoria Hospital. Montreal.

INTERCHANGE OF HEALTH OFFICERS IN THE UNITED STATES

An event which may be fraught with far reaching consequences for world health is the Third General Interchange of Health Officers arranged by the Health Section of the League of Nations which is now taking place in the United States. Representatives from France, England, Italy, Russia, Poland, Spain, Holland, Belgium, Greece, Jugoslavia, Germany, Switzerland, Norway, Mexico, San Salvador, Brazil, Chile, and Canada, delegated by their respective governments to participate in a course of study and observation, arrived in America the first week in September and will remain for approximately three months. Until September 22nd the delegates will remain in Washington, studying national health organization as administered by the United States Public Health Service. Following the close of the course of study of the national health agency, the delegation of visitors will separate into three groups, one of which will proceed to Virginia, another to North Carolina and a third to Alabama, where about three weeks will be spent in studying state and local health departments. Richmond, Va.; Raleigh, N. C. and Montgomery, Ala., are the Southern cities which have been selected for study. From there the groups will proceed to Massachusetts, New York and Pennsylvania, respectively, for the purpose of studying the health administration in three northern states and small cities. Syracuse, N. Y.; Allentown, Pa.; and one of the smallest cities of Massachusetts yet to be designated, will be visited for a short period. Following this the groups will make a study of health administration in three of the large cities of the east, namely, Boston, New York, and Philadelphia. Present plans call for a re-assembling of the entire delegation in Washington late in November for a final conference.

The group of visiting sanitarians number among its members many of the most eminent in the world. Canada is represented by Dr. M. M. Seymour, Deputy Minister of Public Health, and Director of Venereal Disease Control, Saskatchewan. The delegation is accompanied by Dr. Norman V. Lothian of the Health Section of the League of Nations. Surgeon General Hugh S. Cumming, of the United States Public Health Service, delivered the address of welcome to the delegates.

ALVARENGA PRIZE OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA

The College of Physicians of Philadelphia announces that the next award of the Alvarenga Prize, being the income for one year of the bequest of the late Senor Alvarenga, and amounting to about Three Hundred Dollars, will be made on July 14, 1924, provided that an essay deemed by the Committee of Award to be worthy of the Prize shall have been offered. Essays intended for competition may be upon any subject in medicine, but cannot have been published. They must be typewritten, and if written in a language other than English should be accompanied by an English translation, and must be received by the Secretary of the College on or before May 1, 1924. Each essay must be sent *without signature*, but must be plainly marked with a motto and be accompanied by a sealed envelope having on its outside the motto of the paper and within the name and address of the author. It is a condition of competition that the successful essay or a copy of it shall remain in possession of the College; other essays will be returned upon application within three months after the award. The Alvarenga Prize for 1923 has been awarded to Dr. Edward P. Heller, Kansas City, Mo., for his essay entitled: "Treatise on Echinococcus Disease." John H. Girvin, *Secretary*, 19 South 22nd Street, Philadelphia, Pa., U. S. A.

It is with pleasure that we note as we are going to press that the Nobel Prize for Medicine for 1923 has been awarded to Drs. F. G. Banting and J. J. R. Macleod of Toronto, for their discovery of Insulin. Dr. Banting is the first Canadian to receive a reward from this Foundation. He is a native of Alliston, Ont., and a graduate of the faculty of Medicine of Toronto University. He made a brilliant record as a student and also attracted attention while engaged in his post graduate studies overseas. During the Great War he served for three years with distinction and was awarded the Military Cross for valour. Upon his return he held posts at the Christie Street Hospital, Toronto, for disabled soldiers, and later at the Sick Children's Hospital in that city. Finally he devoted himself to research work in the Connaught Laboratories of the University of Toronto. The Nobel prize is awarded by a Board of Directors who have charge of the fund amounting to $9,000,000 bequeathed by the Swedish scientist Alfred B. Nobel who died in 1896. Under the direction of the Board awards of an average value of about $40,000.00 each are made, not only in medicine but in physics, chemistry, literature and several furthering the cause of peace. The Board of Directors consists exclusively of Swedes.

Dr. Frederick G. Banting, who, along with Professor J. J. R. Macleod, has been awarded the Nobel preventive medicine in the University of Toronto, has Prize, expressed his deep appreciation this morning for the assistance which he has received from all his co-workers in the discovery of insulin. "I desire to share my portion of the award with Mr. Best," said Dr. Banting this morning. "Both in the honour and the financial aspect, and, furthermore, the financial end will be devoted to the advancement of medical research in some line.

"I also would like the medical sciences of Canada to share with me the honours which have come. I would like to mention again with grateful appreciation the assistance which I have received from Prof. V. E. Henderson, Dr. Fitzgerald, of the Connaught laboratories, and Dr. R. D. Defries."

Dr. Banting denies absolutely that he has been working on a serum to combat pernicious anaemia. Ever since the report got around he has been having letters, telegrams and messages of all sorts coming in upon him. He said "the greatest service people can do is to leave us alone to work."

FUND BEING RAISED FOR ST. ANDREW'S INSTITUTE

At a meeting of the Council of the St. Andrews Institute of Clinical Research it was reported that the sum of £5,000 had been received as a first instalment of the fund being raised by the well-wishers of the institute in Perthshire. The institute was established in 1919 by Sir James Mackenzie, M.D., F.R.S., who is a native of Perthshire. Convinced that an institute was necessary for the investigation of the cause and origin of disease and amelioration of human suffering, Sir James Mackenzie gave up a large consulting practice in London in order to devote his whole time and energies to this work. During the four years of its existence the institute has made some valuable contributions to medical science.

The Perthshire fund is being raised as a tribute to the great work of a son of Perthshire. It is hoped that a total of £10,000 will be reached. The method of investigation is entirely new, and there is no similar system or institute in Great Britain or, indeed, any other country in the world. The manager of the Bank of Scotland, Perth, is the hon. treasurer of the fund.

In the Bulletin of the Canadian Tuberculosis Association, the detail is given of the time given to instruction in tuberculosis in the various medical schools of the country. It is quite evident from the statement made that instructions in tuberculosis are being given in a well regulated manner about the country. It is interesting to note that at the University of Montreal there is an Institute Bruchesi founded for the purpose of instruction in tuberculosis, and that there is a chair of Phthisiotherapy endowed.

The papers presented at the Annual Meeting of the Canadian Tuberculosis Association at Edmonton, have been put together in a serviceable booklet for distribution. Many problems in tuberculosis are handled by men well known for their work in the subject, rendering the booklet interesting reading. Copies can be procured from the Canadian Tuberculosis Association, Bank St., Ottawa.

The Department of Health has issued a pamphlet of twenty-two pages giving the latest and most practical details regarding the diagnosis and treatment of the venereal diseases. It is sent forth as an appendix to previous pamphlets. The Deputy Minister congratulates the members of the medical committee of the Canadian Social Hygiene Committee on the excellence of their contribution. We desire also to congratulate the Department of Health on the good work it is doing in the publication and free distribution of pamphlets on so many subjects affecting public health.

NOVA SCOTIA

A very attractive programme has been outlined for the coming season's meetings of the Halifax Medical Society. The society will meet this session under the presidency of Dr. M. G. Burris.

Recent defections from the ranks of single blessedness include Drs. P. N. Balcom, of Aylesford; C. E. Aikens, of Guysboro'; C. M. Bayne, of Kentville; and A. M. Hebb, of Dartmouth. The *Journal* extends congratulations and best wishes to all these gentlemen.

An investigation of the financial affairs of the City Health Board of Halifax has disclosed a shortage in the accounts of the Secretary, and has led to the dismissal of that official. A reorganization of the department is being considered.

The classes in Medicine at Dalhousie University were resumed September 12th. Several additions to the staff of the Faculty of Medicine have been made recently. Dr. Clyde Holland, who won distinction at Dalhousie in both Arts and Medicine, and Dr. Margaret Chase, (B.A. Acad. and M.D. Dal.) have been appointed to full time positions in the departments of anatomy and pathology respectively. Mr. R. J. Bean, formerly of the staff of the Western Reserve University, has been appointed associate professor of histology and embryology. Dr. E. Gorden Young, associate professor of bio-chemistry at the Western Ontario University, has been selected as the head of the department of bio-chemistry, but will not assume duty at Dalhousie until the first of the new year. The vacancy in the department of biology, created by the resignation of Professor J. A. Dawson, has been filled by the appointment of Professor J. N. Gowanloch, recently of the Wabash College staff. The affiliation of King's and Dalhousie, which has happily been accomplished, has combined the teaching force of the two universities, and Professor N. J. Symons, of the King's foundation, will henceforth give the instruction in psychology to the medical classes, while Professor A. S. Walker, also of King's foundation, will lecture to the first year medical students on the History of Thought; a new subject which replaces the option formerly allowed.

The post-graduate week, conducted under the auspices of the Medical Faculty of Dalhousie, again proved very successful this year. The attendance was most gratifying, and the committee of arrangements, of which Dr. George H. Murphy was chairman, and Dr. Alan Curry was secretary, received much praise for the manner in which the programme was arranged and carried out. On the eve of the concluding day, a dinner was tendered to those who had participated in the course by the Governors of the University. This function was held at Shirreff Hall, the beautiful new residence for lady students, and proved to be most enjoyable. During the evening, reference was made to the proposal to attempt a graduate school at Halifax next year, with Shirreff Hall as the home *pro tempore* of those attending the school. The proposal was received with great enthusiasm, and several of those present at once announced their intention of taking the course, as they could conceive of no more ideal arrangement for combining instruction and recreation. It is intended that this school shall be Canadian in character, as it is expected that much of the teaching will be done by men from other colleges, and it is felt that physicians from the interior will welcome the opportunity of receiving graduate instruction under an arrangement which will permit of much pleasant recreation in the delightful weather which characterizes the summer season in Nova Scotia.

PRINCE EDWARD ISLAND

The annual meeting of the Prince Edward Island Medical Society was held at Summerside on Wednesday, July 11th, 1923. Dr. J. A. McPhee, the President, in the chair. The morning session was devoted to general business. Dr. R. F. Seaman of Charlottetown, was elected President for the ensuing year. The President's address, by Dr. McPhee, reviewed the advance of surgery during the last few years, laying emphasis on application of modern methods to general practice as we see it in country towns. Dr. Alex. MacNeill of Summerside, gave a case report on a "Septic Knee Joint," which was discussed by Dr. Bazin of Montreal. Dr. W. Tidmarsh, of Charlottetown, read a paper entitled "The Protein Milk Treatment of Diarrhoea in Bottle-fed Infants." In the afternoon, Dr. F. H. MacKay of Montreal read an excellent paper on "Encephalitis Lethargica." This was followed by a paper on "Brain Infections" by Dr. S. J. McLennan, of Halifax. Prof. W. L. Holman of Baltimore gave an excellent presentation of the more important facts of Bacteriology and Immunology as applied to general practice. Dr. David W. MacKenzie of Montreal read an interesting paper illustrated with lantern slides, on "Haematuria, its Common Causes" a review of 900 such cases admitted to the Department of Urology, Royal Victoria Hospital. Dr. A. T. Bazin of Montreal presented a review of the literature on "Intussusception, Primary and Secondary," and reported a very instructive case. The meeting was closed by a dinner at the Queen's Hotel. The whole meeting was a definite success, as nearly every practicing physician on Prince Edward Island was present, along with several visitors . The President in reviewing his programme, announced, with pride, that three of his visiting contributors were natives of the province. The next meeting will be held at Charlottetown, and it is planned, if possible, to have it in connection with the Maritime Section of the American College of Surgeons.

D. W. Mack

QUEBEC

Dr. Kanaan Offiesh was tendered a branquet recently by the Syrian National Club on the occasion of his departure for Egypt, where his father is seriously ill.

A course of lectures on "The Treatment of Venereal Diseases" has been given by Professors Archambault and Fournier at the Notre Dame Hospital, Montreal, during the present month, and has been open to physicians on the payment of a small fee.

Dr. V. M. MacDonald, director of the Child Welfare Association of Montreal, has been selected as one of the Canadian delegates to represent the Dominion at the first annual meeting of the American Child Health Association, which will be held in Detroit, Michigan.

Dr. John Copeland has recently taken over his new duties as assistant superintendent of the Montreal General Hospital. Dr. Copeland succeeds Dr. Don Smelzer, who has left for Buffalo, N.Y., to assume the post of assistant superintendent of the General Hospital there. A graduate of McGill, class 1921, Dr. Copeland has been on the staff of the Montreal General Hospital since graduation. He served overseas and was seriously wounded.

Dr. T. J. W. Burgess, since 1890 superintendent of the Protestant Hospital for the Insane at Verdun, was presented with a hall set recently by the staff on the occasion of his retirement as active manager of the institution. Dr. Burgess, who will be succeeded by Dr. C. A. Porteous, becomes consulting physician to the hospital. Dr. Burgess also received from the board of managers and friends a cheque in recognition of his long and faithful services.

Dr. Gordon Byers returned to Montreal late in September after spending the summer in Switzerland. Dr. Byers was much interested in, and carefully studied the working of, the new Gullstrand slip-lamp. With this apparatus the interior of the eye can be brilliantly lighted and viewed under great magnification. The instrument, which is of practical value and of great scientific interest, has been specially developed by Professor Vogt, who holds the chair of ophthalmology in Zürich.

Dr. Donald C. Smelzer, late assistant superintendent of the Montreal General Hospital, who will assume the duties of assistant superintendent at the Buffalo General Hospital, graduated in 1918 and immediately went overseas. He served as medical officer in the Near East for some time. On his return invalided to Canada he became connected with the Ste. Anne's Military Hospital at Ste. Anne de Bellevue. In 1921 he joined the staff of the Montreal General Hospital, where he acted as admitting officer for a year; afterwards succeeding Dr. M. Young, as assistant to Dr. Haywood. On the occasion of his departure, he was the recipient of many good wishes from his hosts of friends both in the hospital and in the city generally.

The first meeting of the Montreal Medico-Chirurgical Society was held in the Chambers, 176 Mansfield Street, on the evening of October 5th, 1923. The feature of the meeting was the address of the retiring president, Dr. Harry S. Shaw, on the Renaissance of Medicine, presenting a sketch of the literary and historical phase of medicine during its long struggle for freedom from the bonds of the prevailing superstition of earlier periods. Short pen-pictures of the men who made this renaissance possible were features of the address.

Dr. Laidley read an eulogistic address on the life and works of the late Sir Thomas Roddick. His remarks were greatly appreciated for they bore testimony to his character as a kind and considerate friend as well as to his ability as a surgeon. An informal smoker closed the meeting. Dr. W. F. Hamilton on behalf of the Society presented Dr. S. Hanford McKee, the retiring secretary, with a gold fountain pen in recognition of the faithful services which he had rendered as secretary during the last 17 years, to which Dr. McKee suitably replied.

ONTARIO

OTTAWA'S NEW MATERNITY HOSPITAL

Ottawa's new Maternity Hospital, erected by the Salvation Army with subscriptions received from the Kiwanis and Rotary Clubs, Masonic and Orange Lodges, and other societies, and by local business firms and private individuals, is now well on in its second year of operation.

The hospital has forty-six obstetric beds, two delivery rooms, and is equipped for surgical obstetric work

—the operating room being largely furnished by the Ottawa Medical Society. The chart forms are compiled from those of the leading American and Canadian Maternities—those of the Chicago Lying-In proving especially worthy of adoption. The Record System is the Unit History System of the Presbyterian Hospital, New York, having one cardboard cover for all records of a mother and her children for repeated admissions.

During the first year there were 600 deliveries, 2 Caesarean Sections, 2 blood transfusions on mothers and 3 on babies. There was one maternal death due to the toxaemia of pregnancy.

The hospital has an attending staff including a pediatrician, but is open and used by doctors from the surrounding country even as far distant as twenty-three miles.

On September 27th, Dr. J. C. McClelland of Toronto, addressed the Bruce County Medical Society at Tara on "Diseases of the Genito-Urinary Tract."

The opening meeting of the Academy of Medicine, Toronto, took the form this year of a dinner, followed by an address of the President, Dr. John T. Fotheringham.

Sir William Lister, K.C.M.G. will speak at the section of Ophthalmology and Oto-Laryngology on Monday, October 29th, taking as his subject "Holes in the retina and their clinical significance."

On October 4th, Dr. John Oille of Toronto, addressed a meeting of the Peterborough Medical Society on "The Diagnosis, Prognosis and Treatment of Cardiac Irregularities."

On October 5th, Dr. E. R. Secord of Brantford, read an interesting paper on "Fractures," at Lindsay, Ont., before a meeting of the Victoria County Medical Society.

The Lambton County Medical Society met on October 10th at Forest; an address was given by Dr. D. E. Robertson of Toronto, on "Acute Osteomyelitis."

On October 10th, the Hastings County Medical Society met at Trenton, and listened to an address given by Dr. L. J. Austin of Kingston, on "Carcinoma of the Breast."

The Simcoe County Medical Society met at Allandale on October 18th; an address was given by Dr. E. E. Cleaver of Toronto, on "The Etiology, Diagnosis and Medical Treatment of Gastric and Duodenal Ulcer."

The Lincoln County Medical Society held a meeting on September 28th in St. Catharines; an address was given by Dr. A. Moir of Peterborough, on "The Diagnosis of Surgical Diseases of the Gastro-Intestinal Tract."

On October 11th, the Northumberland and Durham Medical Society met at Port Hope; two addresses were given, one by Dr. A. J. Grant of London, on "Office Treatment of Haemorrhoids and Kindred Conditions under Local Anaesthesia," and one by Dr. W. B. Hendry of Toronto, on "Obstetrical Injuries and their After Results."

The University of Toronto will be represented at the Tri-State District Medical Association, to be held in Des Moines, Iowa, October 29th, 30th and 31st, by President Falconer and Dr. Clarence K. Starr of the Department of Surgery. Dr. Starr will conduct a clinic dealing with fractures and surgical treatment of the extremities. Dr. Falconer will give an address on "The fashioning of the English people," and will also be one of the speakers at the formal banquet.

Huron Medical Association held its quarterly meeting at Goderich on October the 5th. Papers were read by Dr. Milne of Blythe, Dr. B. C. Weir of Auburn ,and Drs. A. H. Macklin and Harold Taylor of Goderich.

The officers appointed for the ensuing year were, President, Dr. R. C. Redmond of Wingham; Vice-President, Dr. Margaret Calder of Wingham; Secretary-Treasurer, Dr. Stewart of Wingham.

Following a custom inaugurated a year ago during the provincial meeting of the American College of Surgeons, the Academy of Medicne invited the public to a Community Health Mass Meeting in the Majestic Theatre as a tangible, practical expression of the interrelations of the public and the profession. There was a large audience and it is certain that the message of Cancer Control and Goitre Prevention has gone deep into the minds of the London public.

Drs. Stuart Evans and A. E. Mahood, of Ottawa, have returned from a clinical trip to Vienna. They report excellent courses in anatomy, major cadaver surgery, and surgical pathology at very moderate cost. They were not impressed with the operative work. Among many interesting items they report are the German abortion laws. Factors which prejudice the welfare of a child, such as tuberculosis in the husband, or even unemployment, are legitimate indications for a dilatation and curettage. N. M. G.

Improvements and changes in the administration of the Ontario Public Institutions have been undertaken by the cabinet of Premier Ferguson. These changes are in the line of co-ordinating all Health and Social Service branches in the province under Dr. Forbes Godfrey, Minister of Health. The change will affect such clinics as the dental and general health clinic which were formerly administered by a sub-department under the Minister of Education. It is planned that ultimately the absolute control of the asylums and the provincial hospitals will be placed under the Health Department for all purposes, and it is felt that the Department of Health will expand into one of the most important departments of the government.

The annual meeting of District No. 2 of the Ontario Medical Association was held on October 3rd in Stratford, under the auspices of the Perth County Medical Association. The meeting was well attended by doctors of the entire district. During the afternoon session, Dr. E. M. Eberts of Montreal gave a very instructive paper on "Myocardial Changes in Exophthalmic Goitre and Toxic Adenoma; pre-operative treatment and post-operative results of same." This was followed by a paper by Dr. John Phillips of Crile Clinic, Cleveland, on "A general Discussion of some of the problems of diagnosis and treatment of Gall Bladder Disease." The afternoon meeting was followed by a banquet at the Chamber of Commerce at which Dr. Weston Krupp of Woodstock, the District representative, presided. Instructive addresses were given on "A Résumé of the Work of the Past Year," by Dr. F. C. Routley the Secretary, and by Dr. J. F. Argue of Ottawa, President of the Ontario Medical Association.

The Annual Medical Day held under the auspices of the Hamilton Medical Society and the staff of the Hamilton General Hospital, took place on Wednesday, October 10th, 1923, at the Hamilton General Hospital. The morning session was a surgical clinic conducted by Dr. J. H. Gibbon, Professor of Surgery, Jefferson Medical

College, Philadelphia, Pa., who demonstrated the surgical procedure in conditions affecting the stomach, duodenum, chest, and the thyroid glands. In the x-ray department there was the presentation of an illustrated paper by Dr. W. N. Carrick. The medical clinic in the evening was conducted by Dr. Thomas Macrae, Professor of Medicine, Jefferson Medical College, Philadelphia, Pa. Dr. Macrae dealt in particular with, (1) Encephalitis, (2) Joints, (3) Auricular Fibrillation, (4) Asthma, (5) Intravenous Medication, (6) Anemias, (7) Acute Rheumatic Endocarditis.

The Board of Governors of the Hospital invited those attending the clinics to luncheon in the nurses' dining hall. In the evening the Society dined at the Royal Connaught Hotel and were addressed by the Honourable Forbes Godfrey, Minister of Health and Labour, and by Dr. F. B. Mowbray, of Hamilton.

The Annual Meeting of District Number Six in the Ontario Medical Association, comprising the Counties of Victoria, Peterborough, Durham, Northumberland, Prince Edward, Hastings and Halburton, was held at Cobourg on Thursday, September 27th. During the afternoon the following programme was presented:—"Some Side Lights on So-called Indigestion," by Dr. John A. Macgregor, London; "Exophthalmic Goitre," by Dr. I. G. Bogart, Kingston; "The Right Iliac Fossa—A Plea for care in diagnosis and treatment," by F. N. G. Starr, Toronto. The discussion which followed each paper contributed materially to the interest of the session. At 5.00 p.m. the doctors were the guests to tea of Dr. and Mrs. Hayden, the local doctor's wives assisting Mrs. Hayden with what proved to be a very delightful hour. At 7.00 p.m. the meeting reconvened at the British Hotel where a most sumptuous banquet was served, being immediately followed by addresses from Dr. Mylks, Kingston, on "Gynaecological Emergencies in General Practice, with Diagnosis and Treatment;" Dr. J. F. Argue, Ottawa, President of the Ontario Medical Association and Dr. T. C. Routley, Secretary. The attendance during the day was between eighty and ninety, a most creditable showing indeed and by far the largest attendance that has turned out to a meeting of the district. Congratulations are due Dr. E. A. McQuade of Trenton, Counsellor of the District and to the Northumberland and Durham Medical Society under whose auspices the meeting was held, for carrying out not only an interesting and pleasing programme, but one of real value and merit to the profession who attended.

District No. 1 of the Ontario Medical Association, comprising Middlesex, Elgin, Lambton, Kent and Essex held their sectional meeting in London on October 4th, in conjunction with the meeting of the Western Ontario Academy of Medicine. There was an excellent attendance from all parts of the district and enthusiasm was everywhere apparent. Morning visitors had opportunity to visit the Medical School of the Western University and attend clinics in Victoria Hospital or laboratory demonstrations in the Medical School. Luncheon at the Tecumseh House furnished an opportunity for fraternizing informally, and at two o'clock the regular program was inaugurated in the Medical School Auditorium. Dr. A. J. Grant presided and introduced the President, Dr. J. F. Argue of Ottawa, who delivered an inspiring address. He was followed by Dr. T. C. Routley whose speech was marked by enthusiasm for the future of organized medicine in Ontario. The achievements of the past year had been both notable and creditable, but there was much yet to be done to further the advancement of the profession both individually and in its organization. A large number of practising physicians are not yet enrolled; there are still abuses to correct both within and without the profession. The scientific part of the programme was furnished by the two visiting physicians and the value of their contribution was evidenced by the lively discussion which followed the reading of their papers. Dr. J. C. Bloodgood of Baltimore, was welcomed enthusiastically on his second visit to Western Ontario in the cause of cancer control. He took as his subject, Cancer of the Breast, giving the results of his experience of emphasizing the fact that early diagnosis means a greater percentage of cure was stressed. Dr. O. P. Kimball discussed hyperthyroidism, claiming that the value of basal metabolic rate was a valuable index, if properly interpreted. He stressed the value of giving sodium bromide, combining it in nearly all his cases with sodium iodide for a term, viewing the reaction to the latter as a therapeutic test of hyperthyroidism.

Obituary

Dr. J. W. Campbell, a well known physician of Kingston, died on October the 11th. He was a graduate of Queen's University in 1891, and was for many years on the staff of Queen's University.

Dr. C. J. Gross died suddenly at his home, 83 Park Ave., from heart disease. Dr. Gross was well-known in Montreal having been in practice in that city since his graduation from McGill University 12 years previously. He served overseas with the Canadian Army Medical Corps from 1917 until the end of the war. He was interested in many Jewish Welfare societies, and was connected with the Montreal Dispensary and other charitable institutions, and was one of the founders of the Montreal Jewish Orphans' Home.

Dr. Edgar Douglas, one of the best known physicians of Halifax, died very suddenly in the early morning of October 7th. Dr. Douglas graduated at McGill in 1904. He quickly established himself in practice, and won the esteem of his fellow practitioners. Very soon after the outbreak of the war, he went overseas where he made a fine record and won the Military Cross. After his return, he took a course in public health at McGill, and received the D.P.H. He was in charge of the Red Cross health caravan which toured a large part of Nova Scotia in 1920, and which attracted the attention of health authorities in many lands. Subsequently, he resumed practice in Halifax, and again enjoyed the confidence and support of a substantial clientele. His sudden death, while in the prime of life, came as a great shock to a large circle of friends and admirers. Less than twelve hours before his death he had been an interested spectator at a football match, and had rendered aid to a player who was injured. W. H. H.

Book Reviews

The Practice of Preventive Medicine. By J. G. Fitzgerald, M.D., F.R.S. Canada, Professor of Hygiene and Preventive Medicine, and Director Connaught Antitoxin Laboratories, University of Toronto; assisted by Peter Gillespie, M.Sc., C.E., M.E.I.C., Professor of Applied Mechanics, University of Toronto, and H. M. Lancaster, B.A.Sc., Director of Division of Laboratories, Provincial Board of Health, Ontario, and Demonstrator in Sanitary Chemistry, Department of Hygiene and Preventive Medicine, University of Toronto, and chapters by Andrew Hunter, M.A., M.B., F.R.C.S.; J. G. Cunningham, B.A., M.B., D.P.H.; and R. M. Hutton, with appendix articles by various contributors. Octavo 712 pp. with app. and index, 826 pages in all. St. Louis, C. B. Mosby Company, 1922.

This is a well printed, well illustrated and a clearly and concisely written volume eminently practical in its details, one of which the profession in Canada may well be proud. Edited by Prof. Fitzgerald, a laboratory man of high standing who has associated with him other members of the teaching staff in the University of Toronto, it presents the modern views in preventive medicine and public health as taught and practised in Ontario and we may add throughout Canada. In his introduction the Editor emphasizes the necessity for the practising physician of the present day to aim at more than the cure of the sick, important as that is; his endeavours should be also directed to the maintenance of health in all those entrusted to his care, and to the furtherance of all sanitary measures in his neighbourhood and county. He looks forward to the time when the State should provide a service for those to whom the cost of complete family health supervision is prohibitive. Such a service should be free to all, rich and poor alike, and no stigma of charity should be attached to its acceptance. This service should include provision for antenatal supervision, home visitation and infant welfare centres to safeguard the health of infants and little children, medical and dental supervision in schools and colleges, and clinics for the periodic medical examination of adults; in short a service which will have as its first aim the promotion of health and the prevention of disease. With it may be linked a system of hospitals, etc. for curative medicine. In all measures, however, prevention should be the keynote. Unfortunately mere nationalization of such a service does not of itself ensure perfection. In such a service three parties are concerned, officers in charge of administrative details; physicians who would be responsible for the work itself, and the general public. As Sir George Newman in a late report states, the individual citizen must be educated to recognize his responsibilities, and if he is to reap his full advantage he must at the same time act loyally as a member of the community.

The preventable causes of death in a community reach a high percentage; nearly 50% of the total number recorded in the registration area of the United States for the year 1909 are classed as such. This high percentage can, and undoubtedly will be greatly reduced when precautionary measures now recognized as effective are carried out in every community.

Fitzgerald groups the large majority of the preventible diseases under the following heads.

Those in which the etiological agents are transferred from the sick to the well in the secretions of the mouth, nose and throat.

Those which are transmitted in water or food contaminated by excretions from the intestinal or urinary tracts of the sick.

Those in which the infecting organisms are transferred from the sick by means of the bite of some species of insect.

Those in which infection occurs through actual contact as in venereal disease and a small group in which the infecting organism appears to live, some stage of its existence in the soil, though their habitat is really the intestinal tract of lower animals.

The control of these communicable and preventible diseases is discussed from the standpoints of their incidence, etiology, modes of transmission and methods for the prevention of the transference of the infecting agents from those infected. This occupies the first twelve chapters, the smaller half of the volume.

In the following chapters Mr. H. M. Lancaster, now Director of the Federal Laboratory for the Examination of Foods and Drugs, discusses the various possible impurities in water, methods for their recognition, and the most approved means for water purification. This chapter is well written and fairly well illustrated, and is one of the most important in the book. Second only in importance to water is the milk supply of towns and cities. For the young it is all important that it should be obtainable fresh, clean, and free from all pathogenic bacteria, with its nutrient properties in no way destroyed. The whole subject is well and thoroughly treated and includes the hygiene of the stable and the handling of the milk from the time it leaves the udder till it reaches the consumer. A copy of regulations enacted by the Department of Health for its distribution and sale is appended. Food adulteration, poisonous foods, methods for preservation of food and food poisoning are discussed in another chapter. Dr. Andrew Hunter, in an interesting chapter discusses the food requirements of man, diet defects and deficiency diseases. Mr. Peter Gillespie contributes a very excellent chapter on domestic and community sanitation which is well illustrated. Maternal and infant mortality, school hygiene, public and health centres, and industrial hygiene, all occupy separate chapters and are fully discussed. The last 100 pages of the work are devoted to various appendices which are a useful addition to the book. Typographical errors do occur; and in some chapters the selection of the tables and illustrations might be improved. Such defects are incidental to almost all first editions. We hope a second edition will shortly be necessary. We append an excerpt from an English review of the work.

"Dr. J. G. Fitzgerald, professor of hygiene and preventive medicine in the University of Toronto, has written *An Introduction to the Practice of Preventive Medicine* with the object of outlining "some of the work of the physician who is to function on the preventive as well as the curative side of medicine." Although at the outset the practitioner may be alarmed at the sight of a volume of 800-odd pages which only outlines the subject with which it deals, he will not need to read very far before discovering that the author is an original thinker who is able to place facts and conclusions before his readers in an attractive and helpful manner. He looks forward to a time when everyone in the community will feel that an actual stigma attaches to one who has a preventible physical or mental disability and when the physician will be engaged to keep his patient well by routine examination, by supervision and advice. Nearly one-third of the volume is concerned with transmissible diseases, each being dealt with separately as regards its etiology, incidence, mode of transmission, and methods of control. With respect to the last, much sensible advice is given. A very informing chapter on milk is contributed by Mr. H. M. Lancaster, and contains the text of the Canadian regulations with respect to the production and distribution of milk. A very well arranged index adds to the value of a work which is essentially one of reference, and the large number of excellent illustrations are helpful in elucidating the text.—*British Medical Journal*, Aug. 4, 1923.''

The Study of Anatomy. Written for second year medical students. By S. E. Whitnall, M.A., M.D. Renouf Publishing Co., McGill College Ave., Montent, 1923. Price 50 cents.

No movement in modern British medicine is more welcome than that led by some of our younger anatomists who have caught the spirit of Sir Charles Bell and returned to the teaching of living, functional anatomy. A member of this group is Dr. S. E. Whitnall, who until he was called from Oxford to succeed Sir Auckland Geddes in the chair of anatomy at McGill University was known to his British colleagues for his researches into the anatomy of the eye and orbit, and more especially for his gift of covering a great seriousness of purpose by a happy sense of wit and humour. At Oxford he became imbued with the learned humanity which animated one of his teachers —Sir William Osler—and this spirit he has carried back to Sir William's Dominion and allowed it to bubble freely over into a little book which he has entitled *The Study of Anatomy*, intending it for his own students. It deserves a much wider circle; we hope it may spread into every medical school where the English tongue is spoken, for it contains happily expressed precepts which young and old will find helpful and stimulating. The essential lesson Professor Whitnall wishes to press home to medical students is that, on entering the dissecting room, they must keep their imaginations as sharp and lively as their scalpels, and on entering hospital wards they must keep the same faculty equally alert when they palpate, percuss, or auscultate, if they are to reach the source of illness. The beginner, he says, who looks on the skin of his ''part'' as merely something which has to be removed is wasting his opportunities unless he also remembers that it is a living sentient organ endowed with functions which are essential to health and life. The student who has displayed all the structures of his part and has failed to breathe his imagination on them, so as to make them live and move, is in the position of a man who has cut the leaves of a book and thrown it away unread. Our author would have medical students and medical men, as each manifestation of structure or of disease meets their attention, ask themselves a perpetual ''Why?'' and never rest until they find a reasonable answer or explanation. He would have his students, as they examine sections under the microscope, to remember that what they see are artificial snapshots of the living units which carry on the work of the body. Above all, he would have medical students, in these days of crowded curricula, cultivate a sense of perspective, and discriminate between the important and the unimportant. The tradition which has clung to our British chairs of anatomy—that their occupants should be men of wide interests—finds a true representative in Professor Whitnall. In this booklet he places at his pupils' disposal a rich experience gleaned from a close study of how men should order their careers if they would take the best out of life.—*Brit. Med. Journal*, Sept. 29, 1923.

Tubercle Bacillus Infection and Tuberculosis in Man and Animals. — By Albert Calmette, Associate Director, Pasteur Institute, Paris. Translation of the second French edition by Willard B. Soper, M.D., Saranac Lake, N.Y., and George H. Smith, Ph.D., Yale Medical School. Large 8vo. of 714 pages, 31 figures, 25 colored plates. Williams and Wilkins, Baltimore, 1923. Price $8.00.

A great and authoritative work by a master mind to which full justice has been done by the translators and the publishers. No work of such great importance dealing with tuberculosis has appeared in recent years. It is a complete and explicit presentation of the facts and problems of tuberculosis as known to-day. Though the facts are drawn from all available sources, Calmette's own extensive researches into the etiology of tuberculosis, and the processes of infection and resistance form the basis of the work. Calmette to-day is the outstanding worker in this field, and the English reader owes a great debt of gratitude to the translators and publishers for their painstaking labours in making this study available. It is a summary of our present scientific knowledge with the studies and ripe experience of a brilliant scientist.

Our conception of the disease tuberculosis has changed materially in recent years. Here we are given a picture of the processes of infection and resistance, of re-infection and spread within the body. We cannot attempt to give a summary of the immense amount of material here placed before us in an orderly fashion. No one interested in tuberculosis, whether physician, pathologist, laboratory worker or veterinarian, can afford to ignore this notable work. It can be read and re-read and be at all times a work of reference. Some forty-four chapters cover the main subjects presented. These are divided into four main divisions, (1) The tubercle bacillus and processes of infection by it, (2) Experimental tuberculosis and tubercle bacillus infection in animals, (3) Processes of defence and the diagnosis of tuberculous infection, (4) Natural immunity and processes of immunization against tuberculous infection. The closing chapter entitled ''Scientific Principles which should serve as a basis for prophylaxis against tuberculosis'' should be read and mastered by every physician, laboratory worker and public health official who has to deal with tuberculosis. It covers in a small space the facts and conclusions upon which to base our present efforts to combat tuberculosis.

J. H. E.

The Mortality Experience of Industrial Policy Holders 1916-1920. Large 8vo. of 150 pages with 114 tables. A contribution to the Public Health Movement in America by a number of insurance companies. Presented with compliments of Industrial Life Insurance Company of America. New York, 1923.

This statistical study is the report of a committee organized to undertake a collective study of the mortality tables and records of six large industrial insurance companies over a period of five years. The initiative lay with that indefatigable worker Frederick L. Hoffman, and the report is over the signature of Louis I. Dublin. The result is a valuable contribution to the Public Health Movement in America. The companies whose records have been collected are the Colonial Life of America, The John Hancock Mutual, The Life Insurance Company of Virginia, The Metropolitan Life and the Prudential. A limited number of the reports are available for distribution to those interested.

The policy holders include men, women and children of all ages and races. These companies in 1920 had 26,000,000 policy holders in their industrial department, over one-fifth, nearly one-fourth, of the entire population of the United States and Canada, and this would make it appear that almost three of every four men, women and children over one year of age among the wage earning population of the cities are included in the study. There is an added value in these tables over those issued by our health departments in that the reported deaths are investigated by the companies, ensuring a greater accuracy in the certified cause of deaths. In all the tables there is a comparison of the death rate in the industrial policy holders with that of the general population in the coresponding age groups. The age groups cover five-year periods from one to twenty-four years, and ten-year periods from twenty-five to seventy-four years.

From 1916 to 1920 the death rate from tuberculosis has dropped from 170 per 100,000 to 125 in the industrial policy holders, while in the general population in the same period it has fallen from 141 to 112.5.

Influenza and pneumonia covering the period of the great epidemics of 1918 and 1919 receive full attention. Organic heart disease was the third in numerical importance among the causes of death and was an important cause of death at all ages. Even in the age period one to fifteen years it caused more deaths than did measles or whooping cough. Bright's disease ranked fifth in numerical importance as a cause of death, and its rate during the five-year period showed a distinct downward trend. The decline was greater in the insured group than in the general population. Accidents ranked sixth, causing more deaths in the industrial group than did cancer, the seventh in importance, and many more than cerebral haemorrhage which ranked eighth. The accident fatality was rather less than half of that of tuberculosis and rather more than half of that of pneumonia. Accidents are particularly important as a cause of death in old age and early childhood. At ages five to nine the deaths from accident about equalled those from diphtheria and caused one-sixth of the total mortality.

Cancer and other malignant tumours form the seventh cause of death in numerical importance. There is no indication in the five-year period under study, of either increase or decrease in the death rate from cancer in the industrial figures or in the general population.

The studies of the rates in the various infectious diseases, arterial disease, and the puerperal state, offer much suggestive material for the public health worker. The report is presented in somewhat contracted form. The Committee have much more material available on their fyles and promise further analyses if the present report is favourably received. It is to be hoped that the Committee will receive sufficient encouragement to continue these valuable studies.

J. H. E.

Les Colites—By Prof. P. Carnot, Faculty of Medicine, Paris, P. Harvier, R. Friedel and Lardennois. 8vo. of 224 pages ,with 34 figures. Paris, 1923, Libraire J. B. Baillière et fils. Price 10 francs.

This is the second of a series of small volumes appearing under the group title of **Consultations sur les maladies de l'estomac et de l'intestin** under the editorship of Prof. Paul Carnot, and comprising a course of gastro-enterology given in his service at L'Hospital Beaujon. There is a summary of the principal symptoms of colitis, which are grouped on an etiological basis, the parasitic, the infectious, the toxic, and the mechanical, including stasis. The functions of the colon are outlined in a chapter which deals with the most recent physiological researches. This is followed by a study of functional changes, those due to hyper-peristalsis and hypo-peristalsis, spasm and stenosis, and those due to faulty obsorption and secretion. The chemical and microscopical study of the faeces are detailed in such a way as to shed much light upon the diagnosis.

The chapter on amoebic and other parasitic forms of colitis is a very interesting one as is that on the bacterial forms, though the section dealing with tuberculosis is scant and insufficient. Under the toxic forms, Harvier writes specifically of the uraemic form, the mercurial and the gouty. Friedel writes the chapter on recto-sigmoiditis, dysenteric, tuberculous, syphilitic, gonorrheal and other forms whose causative agent is unrecognized.

Lardennois discusses the surgical complications, the malformations of the colon, the ectases and retention. The whole work is well written and gives a succinct summary of the more important points relating to the causation, the diagnosis and the treatment of colitis in its various forms. J. H. E.

Collected Papers of the Mayo Clinic. Vol. 14, 1922. Edited by Mrs. M. H. Mellish. 8vo., 1394 pages, 488 illustrations. Philadelphia, W. B. Saunders Company, 1923. Cloth $13.00. Canadian Agents, The J. F. Hartz Company Limited.

This volume requires no introduction to the medical profession. As the title indicates it is a collection of the 1922 papers and addresses prepared by the staff of the Mayo Clinic of Rochester and of the Mayo Foundation of the Graduate Medical School of the University of Minnesota. All have appeared in various journals and society transactions, but are here published in convenient form for reference. The volume gives a picture of the multitudinous activities of the clinic. There are some eighty-seven contributors and the subjects cover a wide range in medicine and surgery. The contents are conveniently arranged under the major headings of the alimentary tract, urogenital organs, ductless glands, blood and circulatory organs, skin and syphilis, head, trunk and extremities, nervous system, chemistry, technique and general.

Many of the papers have an extensive bibliography and there is a bibliographical index. The illustrations are a valuable feature of the volume.

The general practitioner as well as the specialist will enjoy the work. Whether reading a case report, the record of a research, a study of a series of cases, a summary of our present knowledge of a subject, or a text-book chapter upon one or a group of diseases. The work reflects great credit upon the clinic and upon the editor. J. H. E.

Recovery Record—for use in tuberculosis, by Gerald B. Webb, M. D., Colorado Springs, Senior Consultant in Tuberculosis, A.E.F. President, Colorado School of Tuberculosis, and Charles T. Ryder, M.D. 12 mo. cloth, 195 pages with 108 charts. New York, Paul B. Hoeber, 1923. Price $2.00

This book is the outcome of a happy thought to combine a work of instruction, help and cheer with the patient's records of progress, or rather to combine with the patient's notes and observations, kept for the physician's comments and instructions a useful guide to how to get well. The patient will always have on hand (or in his pocket) a book of helps and hints which tells him the why and the wherefore of the plan of treatment.

The chart pages which are arranged for two years' record carry a cheery, helpful message for the patient. The authors have culled the literature both ancient and modern, medical and lay, to find proverbs and quotations, prose and verse which will carry an optimistic and happy thought to the patient. There is a place for such a book in the present day systematic treatment of tuberculosis, which is usually so prolonged that patient and physician will welcome any addition to the little things that help. To-day the quoted words of Louis are still true, though written nearly a century ago "As our knowledge of the disease becomes more perfect, the mind feels relieved and the horizon widens." J. H. E.

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Practical Dietetics with reference to diet in health and disease. By Alida Frances Pattee. 12 mo., 687 pages, fourteenth edition. A. F. Pattee, Mount Vernon, N.Y., 1923. Price $2.60.

That this work is now in its fourteenth edition and that nearly 240,000 copies have been sold tells the story of its popularity. It has been generally adopted in the leading hospital training schools and in many of the schools teaching domestic science. The author has been assisted in the theoretical part of the work by professors in leading schools of Household Arts, while the chapters on diet in disease have been arranged under the supervision of outstanding physicians. Acknowledgment is made of the assistance of such men as Joslin, Holt, Einhorn, Janeway, Allen and others. The work is eminently practical, such a one as should be in the hands of every nurse, while the physician will also find it of great service in detailing special diets in disease. The surgeon will find much that is helpful in arranging post operative diets in various conditions . The various diets for nephritis are given in full as are those in gastric ulcer. With such a book as a guide the physician should be able to secure the full co-operation of the nurse in any special case.

Accompanying the book is a volume of 142 pages giving the requirements of the various state boards in dietetics and a selection of recent state examination papers. J. H. E.

Diseases of the Ear, Nose and Throat, Medical and Surgical—by Wendell Christopher Phillips, M.D. Sixth revised edition. Illustrated with 578 halftone and other text engravings, many of them original, including 37 full page plates, some in colours. F. A. Davis Company, Publishers, 1922.

This is the sixth edition of this book which in itself is sufficient to show that it has met with very favourable response from the profession generally. The first section which takes up 103 pages has to do largely with the methods of examination, hearing tests, general diagnosis and general therapy of the ear. The book is large enough that it can well afford to devote so much space to this subject. It is one of the best features of the book. There appears to have been an endeavour throughout the book to combine a close connection between general medicine and oto-laryngology. It appears to have been the author's chief desire to thoroughly Americanize this volume, and to give preference to the achievements of Americans. In this, the author has succeeded, for it is a very complete presentation of American practice. This book will be found to be very useful for the general practitioner and the specialist, but from the undergraduate's standpoint, it is much too large. P. G.

Cancer. A Practical Quarterly Journal devoted to the best interests of Cancer. Volume 1, No. 1. Edited by L. Duncan Bulkeley and collaborators. Published by F. A. Davis Co., Philadelphia.

In presenting this new Journal to the profession the editor states that it is the aim and purpose of this publication to bring together in convenient form all advances in our knowledge which may assist the physician to a better knowledge of the medical treatment of this disease. The editor refers to the fact that there is already published in America a journal devoted to cancer research, but states that it has not thus far contributed much to the practical side of cancer, and does not materially aid the practitioner in prescribing the best methods of handling cases of this dire disease. In support of this optimistic effort we notice articles on "Immunity of certain groups of individuals to cancer," and "Nature and cancer," on "Cancer, a curable nutritional disease," on "The systemic treatment of cancer." It also gives the details of six cases of cancer in which the condition was regarded as hopeless and inoperable by surgeons, but in whom under carefully arranged dietetic, hygienic, and medicinal measures, and a local douche, *mirabile dictu*, rapid improvement took place and finally a complete cure. The last fifteen pages of the journal are occupied by a review of recent literature.

Institutional Household Administration.—By Lydia Southard, B.A., Instructor in Institution Administration, Teachers' College, Columbia University. Cloth, Crown 8vo. 214 pp., 91 illustrations. J. B. Lippincott Company, Philadelphia, London, and 201 Unity Building, Montreal, 1923. Price $2.00.

The publishers have projected a series of manuals dealing with institutional administration. This is the first of the series and deals more particularly with the general administration of living quarters including housekeeping. Much of the matter contained will be of value to the housekeeper of a home as well.

The books suggests that it has been prepared for class use, for the teacher rather than the housekeeper of an institution—it appears to be a class room text book rather than a practical manual. It covers a wide field and has many useful suggestions brought together from numerous sources. There is a bibliography appended to each chapter. In addition to a discussion of broad principles there is much detail—for example a chapter on removal of stains, and one on household pests. Floor coverings receive full attention as do curtains, upholstery and furniture. The author has no decided opinions as to the best way to treat and preserve hardwood floors, this might be remedied in a future edition. J. H. E.

A Text-book of Therapeutics, including the Essentials of Pharmacology and Materia Medica. By A. A. Stevens, M.D., Professor of Applied Therapeutics, University of Pennsylvania, Philadelphia. 6th. ed., entirely reset. Cloth $6.25 8vo. p. 793. Philadelphia and London. W. B. Saunders Co., 1923.

This well known text-book must still find favour with the practitioner as a sixth edition has been found necessary. The reviewer, however, greatly doubts its value. The first 517 pages consist of a summary of the pharmacology and materia medica, the following thirty-six pages deal with "Remedial measures other than drugs" and only 183 pages are devoted to "Applied therapeutics." The pharmacology of the drugs is better described in several of the text-books on the subject. The materia medica is often inadequate to guide the prescriber in writing a prescription. For example, there is no indication that the solution of the perchloride of iron is acid or Fowler's Solution alkaline. Nor is there any indication of the alcoholic strength of the tinctures. The authority for doses and names is the U.S.P., which lessens its value for Canadians. The author also finds it still necessary to include all pharmacopocial drugs and many that even the pharmacopoeia no longer admits, their lack of value having been abundantly proven. In consequence, the sections on therapeutics are not reasoned expositions of the pathology and consequent therapeutics but brief compilations of traditional treatment, save in exceptional paragraphs. V. E. H.

The Therapeutic use of Digitalis, G. Canby Robinson, Professor of Medicine, Vanderbilt University. (being Vol. 1, Medicine Monographs). 144 p., 6 x 9. $2.50. Williams and Wilkins, Baltimore.

This excellent book should be read by every practitioner, as it sets forth clearly and definitely the use of digitalis, which is undoubtedly one of our most im-

ASSOCIATED ORGANOTHERAPY BY MEANS OF KERATINIZED CAPSULES OF

PANGLANDINE

Panglandine.

In organotherapy, Panglandine represents the materialisation of Professor Lancereaux's view which recent discoveries have amply confirmed and extended, carried out by COUTURIEUX since 1897 and constantly improved upon since that date by turning to account all the more recent additions to our knowledge in this department of therapeutics.

Organotherapy is indeed the only trustworthy method of treatment in all affections due to functional disturbances of the endocrine glands and physiologists have demonstrated that the only useful organotherapeùtical preparations are those containing the entire dried gland, that the dose thereof should be extremely small in order to obviate too pronounced a stimulating action and they point to the necessity of including the different glands in one and the same treatment and, finally, that the product should be taken in such a form as to ensure its proper preservation and rapid assimilation.

It was with these data in view that the formula of Panglandine was established as follows:

z

Thymus	0.024	Thyroid	0.004
Ovary	0.000.3	Pancreas	0.004.8
Spleen	0.012	Testicular secretion..	0.042
Duodenum	0.003.3	Liver	0.090
Pituitary body	0.004	Prostate	0.014
Suprarenal	0.001.6	in each keratinized tablet	

It will be seen that the proportions of the various glands in no wise correspond to their weight in the human body. This was because it appeared to us preferable to calculate the physiological equivalence of the glands and to include them in our product in quantities proportional to their weight in the fresh state in the animal *i.e.* that to obtain a certain weight of Panglandine we make use of one thyroid gland, one thymus, two suprarenals and so on.

The Endocrinous Glands and their functions.

Here then we have a gland (the pancreas) which possesses at one and the same time an external and an internal secretion, this double function is also present in the liver, the duodeno-jejunal mucosa and the mammary gland; on the other hand every organ, every cell, pours into the blood products which modify its composition.

Are we on this account to look upon the cells as endocrinous organs? No, those only belong to this category of organs which elaborate either nutritive substances or substances having for object to regulate the exchanges, to maintain the internal milieu or to provide for the development of the individual; or functional stimulants (*Hormones*) which, for the most part, have not been isolated or chemically defined, the nature of which, however, is revealed by their physiological specificity.

The nutritive matters (glucose, fats, blood, albumen) are secreted by the liver, the pancreas and the intestinal mucosa.

Substances that regulate functions or chemical processes or control the nutritive exchanges, maintain the internal milieu and the normal development of the body, are elaborated by the pancreas (which regulates the production of sugar); the liver (antithrombin), the testicle, *corpus luteum*, the thyroid, the pituitary body and the thymus.

Lastly, **stimulating substances, or hormones**, are secreted by the spleen (activation of trypsin), the thyroid (increase of nitrogenous and respiratory exchanges), the duodeno-jejunal mucosa (secretin) and the suprarenal capsules (adrenalin).

To the highly important part played by these organs, as shown physiologically by the disturbances that follow changes in, or destruction of, any one of them, must be added the functional correlations that exist between these different glands. This enables us to take a general view of the probable consequences of functional shortcomings.

If the secretion be deficient or, on the contrary, in excess, whether it be modified in respect of its chemical nature—which seems to be mostly the case—we at once get pronounced disturbance of the organism as a whole in which most of the endocrinous glands share and the only effectual treatment whereof consists in introducing substitutive products.

How then can we institute effective organotherapy?

We must give the entire non-modified gland.

The grafts that physiologists have practised on animals after ablation of a gland would be the method of selection were it not that there are several difficulties in the way, viz: first of all a surgical operation that can only be performed by specialized practitioners, then too the grafts as a general rule only survive a short time after which they are either absorbed or encysted; lastly, the graft must be taken from the healthy gland of an individual belonging to the same species. It is plain that in respect of man this condition is virtually impossible to comply with.

Extracts obtained from glands taken from animals constitute a much more practical method, but all physiologists are aware of the extreme fragility of the active principles and know that however carefully handled they are very liable to destruction or transformation. To isolate the active principles of the endocrinous glands as is done for the alkaloids and glucosides of vegetables is assuredly a seductive theory but it is beyond our reach for the time being since, with the exception of secretin and adrenaline, the chemical nature of the other secretions is unknown.

Do we even know which is the secretory tissue, what layer of cells elaborates this or that product or whether the gland is not a laboratory where the different operations follow each other in an uninterrupted chain of reactions?

As long as these questions do not admit of an answer the practitioner's only resource is to administer the entire gland, rapidly dried at a low temperature immediately after its removal from the animal's body.

Only small doses are to be employed.

Organotherapy must moreover be based on this other capital datum, viz. endocrinous substances act in very minute doses "Morphogenetic substances and hormones are bodies that appear to behave as nervous stimulants or to have a diastasic action. They liberate preexisting energy...." (E. GLEY). In point of fact, when we inject a patient with adrenaline the substance administered is almost at once destroyed yet its influence on the blood pressure lasts for several hours, so it follows that the drug must have stimulated the normal secretion of the suprarenal glands.

Continuation of the treatment does not set up intolerance, on the contrary, moderate repeated stimulation brings about restoration of normal function. Yet it is easy to understand that too intense stimulation is likely to have the opposite effect by exhausting the gland with consequent aggravation of the disturbances. Lastly, large doses very rapidly give rise to toxic accidents too well known for it to be necessary to describe them here.

The necessity of administering glands of internal secretion in small doses is therefore solidly established on physiological and toxicological grounds.

Organotherapy must be polyglandular.

When an endocrinous gland is damaged the whole glandular system is affected (H. CLAUDE RENON). As a matter of fact there are correlations, substitutions and antagonisms between the various glands. The splenic blood accelerates pancreatic digestion, the pituitary body and the *corpus luteum* act on the secretion of milk, and the suprarenals have an analogous effect on the blood pressure. Pituitary body and thyroid exert a similar influence on the assimilation of lime, magnesia and phosphorous (FALTA, SCHIFF), etc... Lastly, we are aware of the antagonism between the pituitary body and the thyroid (treatment of Graves' disease); between the pancreas and the suprarenals (PEMBERTON et J. E. SWEET, 1908-1910). In short the whole glandular system may be likened to a complicated machine in which each organ exerts a regulating influence on one or several of the others.

The necessity for **associated organotherapy** is consequently quite plain in presence of deficient secretion or disturbed function. There remain the cases of excessive secretion. Can these be benefited by a mixture of glands with which the hypersecreting gland is associated? Shall we not aggravate the disturbance? A. LŒWY and F. F. RICHTER point to the fact that the testicle and the ovary increase respiratory exchanges only in castrated animals and not at all in entire animals from which we may infer the innocuousness of the treatment in small doses in healthy subjects. On the other hand hyperactivity of a gland is for the most part due to diminished activity on the part of its antagonistic glands. As only the latter will be stimulated every advantage and no drawback attends the administration to the patient of a preparation containing the totality of the glands.

To sum up, PANGLANDINE is at the present time the only preparation that enables us to institute organotherapeutic treatment in accordance with the most recent physiological data, that is to say, with the *entire gland, dried and preserved from contact with the air, in small doses, in association with the various other glands.*

The Indications for Panglandine.

FOR CHILDREN it is prescribed in cases of **myxœdema, delayed growth** (thyroid and pituitary insufficiency), **delayed puberty** (hypothyroidea.) **infantilism** (orchitic insufficiency), **in gigantism and acromegaly** (hypersecretion, pituitary hypersecretion) and in the treatment **of arrested development** (pituitary insufficiency).

IN ADULTS Panglandine is prescribed **in disturbances of the thyroid** function (obesity, **gastro-intestinal disturbances, circulatory nervous disturbances, exophthalmic goitre), in suprarenal disturbances** (Addison's disease, wasting, lowered blood pressure in infectious disease), **pituitary disturbances** (wasting or obesity, glycosuria), **ovarian troubles** of morbid or surgical origin.

Lastly, **PRECOCIOUS SENILITY** due to hypothyroidea and **arterial atheroma** (hypersuprarenalia) are similarly amenable to Panglandine.

Its action however, is highly beneficial in various morbid states characterized by symptoms that do not correspond with any particular affection such as certain forms of debility, rheumatism, obesity,, myocardia, neurasthenia, arthritism, diabetes, wasting, anaemia and intestinal disturbances which are in reality the outcome of a pluriglandular syndrome which is not amenable to symptomatic medicinal treatment whereas Panglandine is productive of excellent results.

THE DOSES to be administered is **from 2 to 6 tablets daily** given between meals, taking the patient's age into consideration and beginning with small doses. In some instances, however, we must give as many as 8 to 10 tablets a day.

It is advisable only to give Panglandine for three weeks in each month in order to obviate the intolerance which would supervene in the long run were the stimulating influence of endocrinous glands maintained. With these precautions the treatment can be carried on as long as may be required without the slightest risk of any untoward occurrence.

Samples sent post free to medical men on request

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portant drugs. G. Canby Robinson is one of the best of the modern school of younger clinical men in the United States and has devoted much time and experimental work to the subject of this volume. His name is well known to all workers in this field. His judgment is sound and his advice to be relied upon. The scientific work is reviewed with great judgment and is properly appraised in the light of clinical experience. On all phases of the action of digitalis and its congeners, the practitioner will find the information he requires for an intelligent clinical use of the drug. Its toxic effects, its use in various types of cardiac failure and in fever, its modes of administration are all clearly set forth. The book is not only a credit to its author but also to the publisher and, if subsequent volumes are of equal value, they will be greatly appreciated. V. E. H.

International Clinics. Thirty-third series, volume ii., 1923. Edited by Henry W. Cattell, A.M., M.D., Philadelphia, with medical and surgical collaborators in United States, England and Canada. J. B. Lippincott Company, Unity Building, Montreal. Price $2.50 per volume, or $10.00 for the series of four.

In this volume over fifty pages are devoted to Insulin and its clinical administration, the remaining pages are divided between Medical Diagnosis and Treatment, and Surgery. Particularly suggestive articles for the general practitioner are those on the diseases due to protein sensitization and their treatment, pityriasis rosea, blood transfusion made easy, the Roentgen ray in diagnosis, chorea, rectal surgery under local anaesthesia, and problems in surgical diagnosis and treatment. There are, too, some excellent special articles on subjects such as electrocardiography, tularemia, the sequelae of epidemic encephalitis and tuberculosis of the kidney.

The editors continue their policy of presenting case reports of interesting conditions with excellent monographs on diseases which are met with frequently in practice. J. H. E.

The Practical Medicine Series. Vol. I, General Medicine. General editor, Charles L. Mix, A.M., M.D. Small 8vo. of 678 pages with 61 full page illustrations and 35 figures in text. Chicago, The Year Book Publishers, 1923. Price $3.50 or the series of eight volumes $18.00.

This series places under review the principal contributions in medicine, surgery and the specialties. Eight volumes comprise the series which is available in set or in single volume. The volume before us deals with Infectious Diseases and Endocrinology, with George H. Weaver as editor; Diseases of the chest, by Lawrason Brown; Blood, Circulation and Kidney, by R. B. Preble; Digestive System and Metabolism, by B. W. Sippy and Ralph C. Brown. The names of the sub-editors vouch for the excellence of their respective departments. Each appears to have omitted none of the important papers which have appeared during 1922 and early 1923.

For the physician who would like to keep in touch with recent contributions to the science of medicine, this series will prove most helpful. J. H. E.

"Opening Doors", John Thomson, M.D., Edinburgh. (Oliver and Boyd.—1923).

This unpretentious little book with a very happy title comes from the pen of Dr. John Thomson. It is intended for the use of mothers of mentally defective children and sets forth in plain and simple manner, not only how a mother may know her child is not developing normally, but also what she may do to bring out what powers may lie dormant in the child.

The tone of the book is delicate and sympathetic. There is no word or statement that might offend a mother sensitive to the backwardness of her child. On the contrary she is encouraged by various means to assist nature in "opening the doors" of the child's mind. The author tells how even the most hopeless cases may be improved to a surprising degree, especially when training is begun early.

Medical practitioners and social workers will also find much to assist them in dealing with the difficult situation often presented by the presence of a defective child in a family. L. M. L.

Legal Medicine and Toxicology. By many specialists. Edited by Frederick Peterson, M.D., Manager Craig Colony for Epileptics; Walter S. Haines, M.D., late Professor of Chemistry, Materia Medica and Toxicology, Rush Medical College; and Ralph W. Webster, M.D., Assistant Professor of Medical Jurisprudence, Rush Medical College. 2nd. Ed. 8vo. 2 vol. p. 2268, 334 illustrations. Cloth $20.00. W. B. Saunders Co., Philadelphia and London, 1923.

This is an excellent book, exceptionally well written and well published; the cuts are very clear and well chosen. The contributors are all men of real experience and write with authority. A feature that will apeal to many physicians is the increased attention that is given to industrial intoxications, and the short but good chapter dealing with poisoning arising from the consumption of food infected with bacteria. The reviewer feels satisfied that this text book will be found to be a useful and satisfactory book of reference for any physician who cares to use it.

V. E. H.

Applied Psychology for Nurses by Donald A. Laird. 229 pages, illustrated. Price $2.50. Published by J. B. Lippincott Company, 201 Unity Building, Montreal, 1923.

This is an ambitious volume and is well conceived, and the author has made an effort to cover this great subject, and yet make it highly practical. There is an unusually interesting chapter on temperaments that will be of value to the nurse that uses this book. One cannot but recommend this Applied Psychology to the nurse who is anxious to get a good knowledge of every type of work in psychology, and it enables one to understand the more usual terms that are used in the wards and the present day theories. At times the author is a little advanced in his views and statements; the volume is suitable for a nursing school but will bear revision. G. W. H.

A Text-book of Chemistry for Nurses, by Fredus N. Peters, A.M., Ph.D. 8½ x 5¼, p. 302, numerous illustrations in text. C. V. Mosby Company, St. Louis, 1923.

This well bound and printed little book is a credit to the publishers as to the author. The book differs greatly from the ordinary text-book of chemistry in that it introduces historical notes on the discovery of the elements described and the development of chemistry and contains much practical information about the uses of the chemicals described which is valuable to the nurses, though often not pertinent to a text-book of chemistry. V. E. H.

A Clinical Guide to Bedside Examination.—By Dr. H Elias, N. Jagic, and A. Luger, Vienna. Translated by Wm. A. Brams, M.D., Chicago. 8vo of 135 pages. New York, Rebman Company, no date.

A small manual for students covering observations to be made by inspection, palpation, percussion and auscultation. It contains too much to be considered as a suggestive outline and is too terse and crowded to be a readable text. J. H. E

Eye, Ear, Nose and Throat Nursing—by A. Edward Davis, A.M., M.D., and Beaman Douglass, M.D. Second revised Edition. F. A. Davis Company, Publishers, 1920.

This is the second edition of what has been found to be a very useful manual on the nursing of ear, nose and throat affections. It is not in any sense a treatise on the disease, nor does it take the place of a textbook for the practitioner or student. Nevertheless, they will find a great deal of helpful information.

P. G.

Books Received

Principles of Bacteriology—By Arthur A. Eisenberg, A.B., M.D. 2nd edition. 214 pages, illustrated. Price $2.25. Published by C. V. Mosby Company, St. Louis, U. S. A.

Homoeopathy—A Live Explanation of what Homoeopathy is and what it means to your Health—By Fraser MacKenzie. Published by The Homoeopathic Publishing Company, 12A Warwick Lane, London.

Official History of the War—By Major-General Sir W. G. Macpherson, K.C.M.G., G.B., LL.D., Major-General Sir W. B. Leishman, K.C.M.G., C.B., F.R.S., LL.D., and Colonel S. L. Cummins, C.B., C.M.G., LL.D. 600 pages, illustrated. Price £1 1s Net. Published by His Majesty's Stationery Office, London, England. Medical Services Pathology.

Chemistry for Nurses—By Fredus N. Peters, A.M., Ph.D. 2nd edition. 302 pages, illustrated. Price $2.50. Published by C. V. Mosby Company, St. Louis, U. S. A.

Walter Reed and Yellow Fever—By Howard A. Kelly. Third Revised Edition. 352 pages, illustrated. Price $2.50. Published by The Norman Remington Company, Baltimore, Md., 1923.

Obstetrics for Nurses—By Charles B. Reed, M.D. Second Edition. 399 pages, illustrated. Price $3.50. Published by The C. V. Mosby Company, St. Louis, U. S. A.

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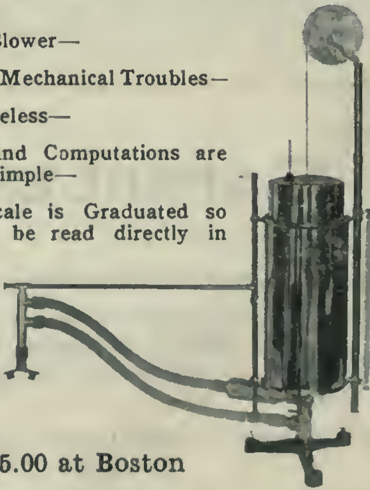

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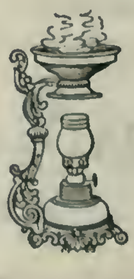

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PLEURAL INFECTIONS*

Duncan Graham, M.B. (*Tor.*)

Professor of Medicine, University of Toronto

CASES in which the physical signs of inflammation appeared to be confined to the pleura have been described as primary pleural infections due to exposure to cold or to trauma of the chest wall without a surface wound. X-ray examinations of the chest and autopsy findings indicate that the majority of these are secondary to a tuberculous infection of the lung located close to the pleura. The few cases of so-called idiopathic pleurisy not due to a tuberculous infection are probably due to a low grade infection of the lung developing in an area of lowered resistance, caused by exposure to cold or trauma. Infections of the pleura, therefore, are rarely, if ever, a primary process but result from the spread of an infection from adjacent structures, most commonly the lung. For this reason the clinical course, prognosis and treatment of a case of pleural infection is determined mainly by the nature and character of the primary infective process of which the pleurisy is a secondary or tertiary manifestation, and by the infective agent present.

Apart from pandemics of influenza, the most common cause of pleurisy with or without effusion is tuberculosis. Occasionally a tuberculous pleurisy is due to the extension of a tuberculosis of the bones of the chest, of the bronchial lymph glands or of the peritoneum, but in the majority of cases it is associated with a tuberculosis of the lung. The character of the pleural reaction, whether dry or fibrinous, sero-fibrinous or purulent, depends mainly upon the activity and severity of the lesion in the lung. The treatment of a case of tuberculous pleurisy must be determined by the character and severity of the tuberculous infection elsewhere in the body. Latent and incipient pulmonary tuberculosis is most often complicated by a fibrinous pleurisy which usually terminates without the development of an effusion by the formation of adhesions between the visceral and parietal pleura. An attack of pleurisy in a healthy adult without physical signs in the lung, or the insidious development of a large serofibrinous effusion is sufficiently suggestive of tuberculosis to warrant the treatment of the case as one of pulmonary tuberculosis. Purulent effusions due to the B. tuberculosis alone are uncommon. Like serofibrinous effusions they should be treated, as cases of pulmonary tuberculosis and not like a non-tuberculous empyema. If pressure symptoms become marked a portion of the fluid should be aspirated, using a needle not a trocar. Pneumothorax occurring in cases of pulmonary tuberculosis is often followed by a pleural effusion. If a valvular or open pneumothorax develops in a case of advanced tuberculosis a serofibrinous effusion appears early and soon becomes purulent due to a mixed infection with B. tuberculosis and other micro-organisms. This form is rapidly fatal despite any form of treatment. Effusions in cases of closed pneumothorax are usually serofibrinous and appear after ten days to two weeks. They should be treated like a serofibrinous effusion without a pneumothorax.

After pulmonary tuberculosis, the most common cause of pleurisy is pneumonia. In acute lobar pneumonia, which is nearly always caused by the pneumococcus, a fibrinous pleurisy appearing at an early stage of the disease is always present. It must be considered not as a complication but as a part of the disease. In a small percentage of cases, variously estimated by different investigators as from six to ten per cent., a serofibrinous effusion of moderate size develops toward the end of the active stage of the pneumonia or after the crisis. Approximately one-half of these become purulent and tend to localize over the affected lobe, usually the lower lobe posteriorly. The presence of an effusion is suggested by a change in the percussion note, the development of flatness, increased resistance to the fingers on percussion over the affected lobe or, more important, a rise in temperature after the crisis has occurred. This should be confirmed by an exploratory puncture. In children, effusions complicating acute lobar pneumonia are usually purulent. The early diagnosis and aspiration of the effusion is important. As pointed out by Cole, purulent exudates complicating lobar pneumonia are often found to be sterile on culture. In many cases the early aspiration of a serofibrinous or seropurulent exudate or the aspiration of a sterile purulent exudate is followed by recovery; in other cases treatment by aspiration and operation later is necessary.

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*Opening discussion on "Pleural Infections" at the meeting of the Canadian Medical Association, Montreal, June, 1923.

In the consideration of pleural infection associated with bronchopneumonia it is important to remember that bronchopneumonia is seldom a primary disease. It develops in the course of, or following some acute infection such as measles or influenza; it may occur as a metastatic pneumonia from infected emboli in ulcerative endocarditis, or from a septic focus elsewhere in the body, as a direct extension from an adjacent suppurating focus, or as a terminal infection in conditions like chronic nephritis, chronic myocardial disease, cancer, etc. Pleurisy associated with bronchopneumonia is, therefore, a tertiary process.

The treatment of pleural infections complicating bronchopneumonia must be considered in relation to the treatment of the primary infective process present. Results in treatment are determined more by our success in the treatment of the primary infective processes or the predisposing cause of the pneumonia than by the particular method or methods employed in the treatment of the pleural infection itself. Although fibrinous pleurisy is not so common with bronchopneumonia as with lobar, pleurisy with effusion occurs more often. The terminal bronchopneumonia of chronic conditions is usually due to a low grade infection of the lung by the Type IV pneumococcus. Pleural effusions, when they occur, are serofibrinous, rarely purulent, and are treated by aspiration. A common form of bronchopneumonia is that following upper respiratory tract infections like measles and influenza. The inflammation of the upper respiratory tract caused by the unknown virus of measles or influenza predisposes to the secondary invasion of the bronchi by the *streptococcus haemolyticus*, *B. influenzae*, less often the pneumococcus, and occasionally by the *B. mucosus capsulatus*. The bronchitis and bronchiolitis is followed by bronchopneumonia, due in most cases to the streptococcus haemolyticus and the pneumococcus. Pleurisy with effusions, serofibrinous or purulent, is a more common complication of this form of bronchopneumonia than lobar pneumonia. Purulent effusions tend to localize over the lower lobe posteriorly, in the interlobar fissures, between the diaphragm and the lower lobe, over the middle and upper lobes or between the lung and the anterior mediastinum. More than one local collection of pus may be present. In patients complaining of malaise and fever with or without cough and expectoration and giving a history of having had an attack of bronchopneumonia one should carefully examine the above mentioned areas for a local collection of pus. A fluoroscopic examination of the chest is of particular value in the diagnosis of this type of case.

Effusions complicating bronchopneumonia, if diagnosed early, should be treated first by aspiration and operated upon later if necessary. As in lobar pneumonia, a pneumococcus empyema may be cured by aspiration. Empyema due to the streptococcus haemolyticus is seldom, if ever, cured by aspiration alone; nor are the results from treatment by operation as favourable as in pneumococcus empyema.

During epidemics of measles and influenza the infection is more virulent, the complicating bronchopneumonia more severe and the incidence of empyema much higher than occurs ordinarily. Reports from the Army Camps of the United States of the bronchopneumonia complicating influenza showed that approximately one-third of the cases were complicated by empyema, which was not only more common but more fatal after infection with the *streptococcus haemolyticus* than with the pneumococcus. Among forty-three cases of influenzal pneumonia treated in the Toronto General Hospital in 1919-20 a seropurulent or purulent effusion was present in seventy-two per cent. The mortality was forty-six per cent. The *streptococcus haemolyticus* alone, or combined with the pneumococcus, or the *B. influenzae* was present in the pleural exudate in fifty-six per cent.; in one case the *B. mucosus capsulatus* was found in pure culture; in the others the pneumococcus alone or combined with the *B. influenzae, staphylococcus aureus* or the *streptococcus haemolyticus* or *streptococcus viridans*. The *B. influenzae, staphylococcus aureus* and the *streptococcus viridans* always appeared in the pleural exudate secondary to the *streptococcus haemolyticus* or the pneumococcus and were never primary causes of the effusion.

This high incidence of empyema in epidemic influenza is associated more particularly with two special types of pneumonia which have been described by Opie and others as suppurative pneumonia with necrosis and abscess formation, and as interstitial suppurative pneumonia. In the former the effusion develops from a small subpleural abscess and may be complicated by a pneumothorax; in the latter the pleura is infected from the lymphatics of the lung. In these cases effusions becoming rapidly purulent develop during the acute stage of the pneumonia. Many patients die during this stage before the effusion has localized. Local treatment of the effusion either by aspiration or operation has little effect in influencing the course of the disease. As the epidemic subsides the bronchopneumonia is not so severe and purulent effusions develop less rapidly and show a greater tendency to become localized in the areas already mentioned. Treatment of the empyema is now more effective. Patients should be treated by repeated aspirations until the acute pneumonic process is over, and then operated upon and drained. As multiple pockets of pus are not uncommon in this type of pleural infections, the chest should be very carefully examined for other pockets of pus if the case is not doing well. Although aspiration is seldom curative in this type of empyema it relieves the patient during the acute stage of the disease and assists in the localization of the effusion and provides a better surgical risk for operation later.

Abscess of the lung is also a cause of pleural infection. A fibrinous pleurisy terminating with adhesions between the visceral and parietal pleura over the abscess area in the lung may result. In other cases a purulent effusion with or without rupture of the abscess into the pleural cavity may develop. If a pyo-pneumothorax results from rupture of the abscess the pleural cavity should be drained.

In conclusion: pleural infections are usually secondary to infection elsewhere in the body; the method of treatment employed, and its effect, depends more upon the nature and character of the primary infective process and the type of micro-organism present than upon any special method of treatment of the pleural infection itself.

Idiopathic Dilatation of the Colon.—D. Firth and K. Playfair (*Arch. of Radiol. and Electrother.*, 1923, p. 321.) point out that all cases of megacolon are not necessarily cases of congenital idiopathic dilatation, since enlargement of the rectum and colon may arise secondarily to mechanical obstruction low down from such causes as stricture. Hirschsprung's disease is a dilatation and hypertrophy of the large bowel due to an obscure cause, but apparently congenital in origin. The following hypotheses, among others, have been advanced to explain its origin—mechanically due to torsion or kinking, atresia of the rectum, and valve formation. Inflammatory changes seen in the gut are probably secondary in origin. A congenital origin (as was suggested by Hirschsprung), with a primary hypertrophy and a secondary dilatation, is supported by the early age of onset and may be allied to the congenital hypertrophic pyloric stenosis of infants. A case is recorded by the authors and a series of radiograms is given illustrating the condition; the gradual filling of the dilated intestine is well demonstrated. In the reported case there was also a scoliosis due to a congenital maldevelopment of half a vertebra, and it is interesting to note that it is said that congenital defects of the central nervous system are frequently associated with malformation of the skeletal system.—*Brit. Med. Jour.*, Aug. 18, 1923.

TUBERCULOUS CERVICAL ADENITIS IN CHILDREN

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THE practitioner who looks up the literature on tuberculous cervical adenitis is confounded by the variety of opinions expressed as to the best means of treating this condition. Exponents of x-rays, radium, and the mercury quartz lamp give high percentages of cures, often with no reference whatever to such factors as, the age of the patient, the stage of the disease, or whether pulmonary tuberculosis is or is not present. The specialist in tuberculosis is inclined to take the view that the disease is a generalized one, and that if the patient receives treatment along general lines the local condition in the neck will take care of itself. It is the aim of this communication to review the fundamental principles and facts that underlie all forms of treatment, and to set forth fairly what can be expected from efficient surgical treatment of this condition in children. Conclusions regarding the efficacy of surgical treatment are based not alone on a study of the literature, but are confirmed by the author's own experience.

Much has been written regarding the portal by which the tubercle bacillus gains entrance to the lymph glands of the neck. The evidence to convict the tonsil in a large proportion of cases seems ample. Primary tuberculosis of the tonsils was first reported by Orth[1] in 1879. Wood[2] collected 1,671 cases from the literature, in which the tonsillar tissues were examined for tuberculosis, and found tuberculous lesions to be present in 5.2 per cent. Weller[3] in 8,697 consecutive tonsillectomies found active tuberculosis in 2.35 per cent. Lewin[4] of Breslau examined the pharyngeal tonsil from 200 patients and found tuberculous infection in 10, or 5 per cent. Sir Harold Stiles puts the figures as high as 9 per cent. Generally speaking we may say that 5 per cent. of individuals who are apparently free from tuberculous disease will be found to have tuberculous lesions in their tonsils.

In cases suffering from tuberculous infection of the cervical lymph glands the percentage is much higher. A. P. Mitchell[5] in 106 cases of tuberculosis of the cervical lymph glands found tuberculous lesions in the tonsils in 38 per cent. Williams[6] examined the faucial tonsils of 29 cases of tuberculous cervical adenitis and was able to demonstrate tuberculous lesions in 86 per cent.

Cornet[7], Wright[8] and others have reported the finding of tubercle bacilli on the mucous membrane of the naso-pharynx of healthy persons. There is also ample evidence to show that infection can pass through the mucous membrane and infect the lymphatics without leaving visible evidence of their transit. Cornet[7] brushed tubercle bacilli on the mucous membrane of healthy animals producing tuberculosis of the cervical lymph glands, the mucous membrane showing no lesions. Lexer[9] has shown that micro-organisms can enter the body through the tonsil, leaving no trace in that organ. Wood,[2] in a series of animal experiments showed that in the guinea pig, in which the tonsillar tissue is scanty or absent, the cervical glands are with difficulty infected with tuberculosis, while in the hog, whose throat is well supplied with tonsils, infection is easy. The comparatively greater development of tonsillar tissue in the child may, to some extent, explain the high incidence of tuberculous cervical adenitis in children.

The teeth are probably secondary only to the tonsil as a portal of entry in infection of the cervical glands. Starck[10] examined 113 children with cervical adenitis, and found 41 per cent. due to carious teeth. He demonstrated the same organism in the gland, teeth, and connecting lymphatic vessels in some cases, in others he showed the local dependence of the glandular swelling on the carious teeth. One of my cases developed swelling of the submaxillary glands three weeks after the extraction of a lower molar on the same side. The glands when excised, proved to be tuberculous. Moorehead[11] and others have reported cases of tuberculous lymphadenitis with carious teeth, in which the tubercle bacilli were found in the decayed root pulps. The cervical glands may also be infected with tuberculosis from the middle ear, mastoid, scalp, the skin on the face, or ulceration in the mouth or nasal cavity.

Theobald Smith[12] in 1898, published a paper describing differences between tubercle bacilli found in human beings and cattle. The former he designated "human" and the latter "bovine", which terms are now generally accepted. These differences are morphological, cultural and pathological. Whether mutation of types can occur—that is to say, whether the bovine may, after long habitation in the human body, become transformed into the human type, is as yet undetermined. Orth[1] and others have suggested that this change is probable, and the frequency with which "atypical" or transitional forms are met with would appear to support that view. This view would also in a measure explain the rarity of the bovine type of infection in the adult, though it is common in children. It is not an uncommon occurrence in renal tuberculosis in the adult to find scars in the neck from tuberculous infection of the cervical glands in childhood. Griffith[13] in 106 cases of tuberculous cervical adenitis in children under ten years of age, found the bovine infection present in 72.1 per cent. of cases. Mitchell,[5] in 72 cases in children under twelve years of age, found the bovine type in 90 per cent. Investigations of other workers in this field support the view that the majority of cervical gland tuberculosis in children is due to the bovine type of infection. Generally speaking it may be said that the younger the child affected, the higher will be the percentage due to the bovine form of bacilli. Park and Krumweide,[14] who made a careful study of 1,042 cases, state that bovine tuberculosis, though common in children, is practically a negligible factor in adults; that it very rarely causes pulmonary tuberculosis or phthisis, and that in children it causes a marked percentage of cervical adenitis, and other forms of surgical tuberculosis.

These children are infected with bovine tuberculosis by drinking the milk from tuberculous cows. In a recent survey made in a small city in Ontario, there were found 800 cases of gland and bone tuberculosis in children.[18] A test of the cows supplying milk and cream to this city showed that 14½ per cent. reacted to tuberculin. A test made in 1922 of the cows supplying milk to the city of Winnipeg showed that 45 per cent. reacted to the test for tuberculosis. Some herds tested 100 per cent. positive. In 30 per cent. of the "reactors" the disease was so far advanced that the carcases were unfit for consumption. When we consider that the milk from many of the smaller herds is sold unpasteurized, we realize the great danger from this form of infection to the children of this city.

The case of a family of four children, three of whom developed tuberculosis of the cervical glands after a change of milk supply, is of special interest. This family changed from a pasteurized milk to milk supplied by a small herd, and sold unpasteurized. Two and a half weeks after the change was made a swelling appeared in the neck of the youngest child, which was four years of age. Within the following ten days two of the other children developed enlarged cervical glands. I have not had the opportunity of examining the eldest child (14 years), but the mother states she is not affected. Two of these children I have operated on and the diagnosis of tuberculosis has been confirmed by microscopic examination. The glands in the other child affected have broken down, and are discharging through sinuses. He has not been subjected to operation as yet, but the diagnosis of tuberculosis is undoubted. A government test of the herd supplying the infected milk showed 35 out of 41 milch cows to be tuberculous. 16 of the 35 were so far advanced that the carcases were consigned to the vats.

The number of cases of tuberculous cervical adenitis that are transmitted directly from human beings, would undoubtedly be greatly reduced if sufficient hospital and sanitorium accommodation could be provided to take care of persons who are spreaders of infection, or if provision could be made for the care of children from homes where individuals infected with tuberculosis live.

In the early stages of the disease the tubercles are enclosed in a thick fibrous capsule, and

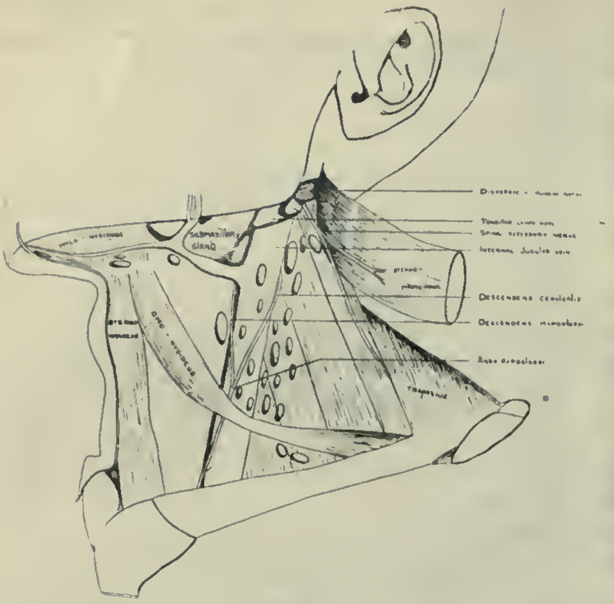

Fig. I.

Showing distribution of the deep cervical and submaxillary lymph nodes. The spinal accessory in this case did not pierce the substance of the sternomastoid muscle. The relation of the tonsillar node to the digastric muscle and spinal accessory nerve is well shown.

Sketched by J. Stacey from cadaver dissection made by the author.

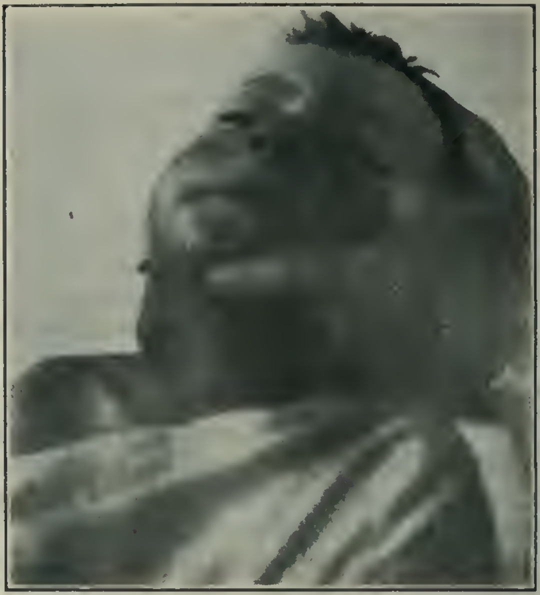

Photo A. 1.

Same case three months later, showing abscess formation, pus about to discharge through skin.

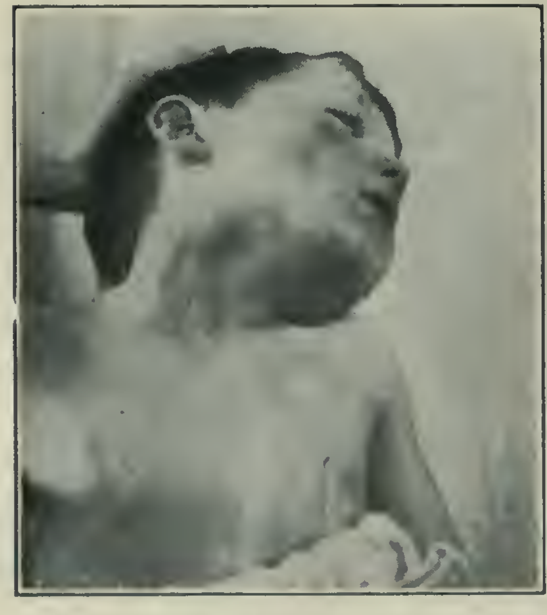

Photo A.

Early tuberculosis of glands at angle of jaw.

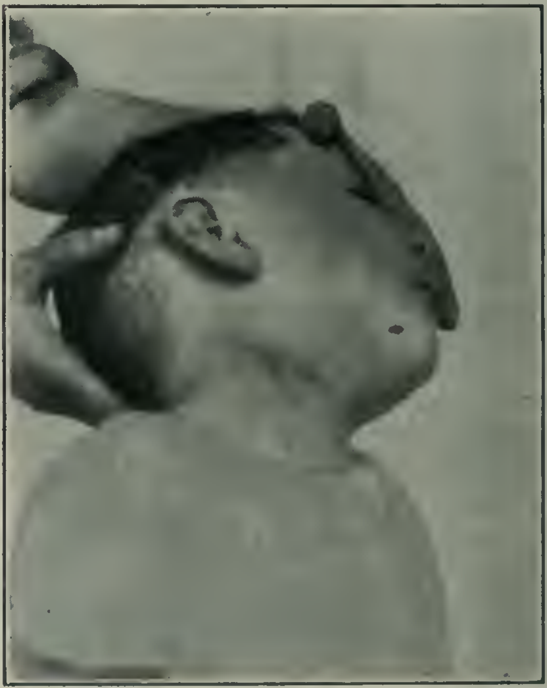

Photo A. 2.

Same case two weeks after operation. The dimple below scar marks point where abscess was about to rupture. Wound closed without drainage. Primary union.

local inoculation of the circulation is rare. However, when the focus breaks down this condition no longer pertains, and direct inoculation of the vascular system may occur. The following case is significant: A male child was seen in consultation at the Children's Hospital who was suffering from tuberculous glands of the neck. The glands were broken down with one or two discharging sinuses, and an abscess was present which was about to break through the skin. This was incised. When the child was next seen a year later, he was suffering from Potts' disease of the lumbar spine, the tuberculous glands in his neck in the meantime having entirely disappeared, only the scars remaining.

The diagnosis in the great majority of cases presents little difficulty. In about 80 per cent. of cases the swelling first appears at the angle of the jaw (see Fig. 2. Photo A.B.). The chronicity, absence of tenderness and other signs of acute inflammation, the tendency of the glands to become massed together with extensive periadenitis is typical. However, in some early cases the glands are discreet, freely movable, and at this stage are difficult to distinguish from simple hyperplastic nodes. A negative Von Pirquet reaction is of value. The tonsils and adenoids should be removed and examined for tuberculosis, and other local foci of infection attended to if present. If, after a reasonable period of observation the diagnosis is still in doubt, the removal of one or more glands for microscopic examination is advisable. The doubtful cases will usually be found to be tuberculous. Enlarged nodes or masses of nodes in a child over two years of age, that remain *visible* over a period of two months—lymphosarcoma, Hodgkin's and syphilis excluded—are almost certainly tuberculous. Enlarged glands of syphilitic origin are rarely found in children. Where suspected, other manifestations of the disease should be looked for. A Wassermann test may be of confirmatory value. In lymphosarcoma the nodes usually reach a large size without fluctuation, and are, as a rule, widely disseminated. Chronic discharging sinuses are indicative of tuberculosis.

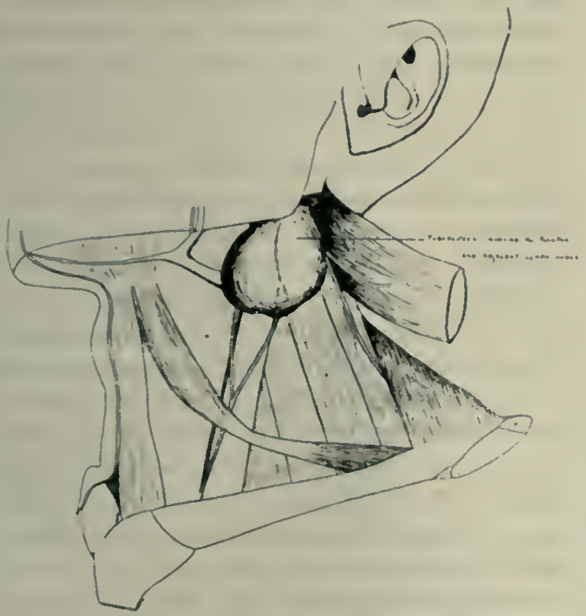

FIG. II.

Showing early tuberculosis involving tonsillar and adjacent nodes. Operation at this stage is comparatively a simple procedure, and the scar scarcely noticeable.

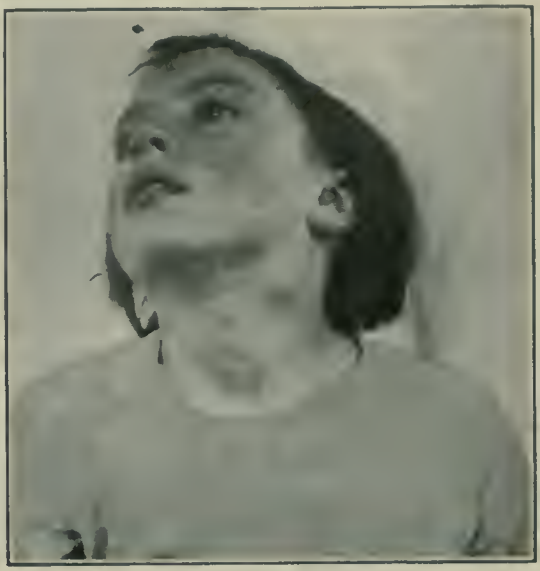

PHOTO B.

Early tuberculosis of glands at angle of jaw.

PHOTO B. 1.

Same case two weeks after operation.

Cysts and sinuses of developmental nature are usually single and have characteristic anatomical locations.

Before any treatment is undertaken, the child should first be thoroughly examined for evidence of tuberculosis other than that in the cervical glands. This of course, includes a thorough clinical and radiological examination of the chest. Local foci of infection, in teeth, scalp, ears, etc., are dealt with if present; the tonsils and adenoids removed. It is not to be expected, however, that the removal of tonsils can have any curative effect on the glandular tuberculosis in the neck. At best it is only closing the portal after the invading army has entered, and while it may prevent it from bringing up reinforcements, it is already entrenched, with ample food supply to carry it on for years. The defensive forces may surround it with a wall of fibrous tissue which will render it incapable of inflicting injury for the time. It is then content to pursue a policy of watchful waiting, in the hope that the army of defence dividing its attention with other enemies, it may seize the opportunity to break its bonds and invade new territory. Or perhaps the barbarians of the north, in the form of a mixed infection may come to its assistance, and with their help it may rapidly break down the barriers that surround it, and gaining access to that great system of transportation, the blood vessels, may over-run the country.

With the mouth and naso-pharynx in a healthy condition, treatment directed toward the affected glands themselves should be undertaken. While the general health of the child should receive attention, the fact that the great majority of children afflicted with this disease are not below the average in general health is attested to by many observers of large experience in this field. This is certainly true of the cases that have come under my care at the Children's Hospital and in private practice. Abbott[15] states that "we are all agreed that tuberculosis is a lymphatic infection in early childhood, and that only when this has become considerable, and when the lymph glands are overwhelmingly invaded, do constitutional symptoms become manifest." I believe that tuberculosis of the cervical glands in children is a purely local disease in the great majority of cases.

There seems to be a considerable variety of opinion as to the most efficient treatment for this disease. Some of the discussion on this subject does not appear to be well considered. There are fashions in medicine as well as in clothes. During the past few years radiation in some form or other has been recommended for a great variety of conditions, including tuberculosis and cancer. I am unaware of any evidence that would indicate that any form of radiation will kill the tubercle bacilli in the affected nodes. Even if radiation may sometimes produce an increase in the fibrous tissue surrounding these foci, isolating the infection from the surrounding tissues, it cannot be spoken of as a "cure." These tuberculous foci may, and do become active in later life.

Cases with involvement of the bronchial or mesenteric nodes, or with lung involvement, probably should not be operated upon. Not because operation if properly performed will not give good results as far as the local condition is concerned, but the involvement in the neck is only a part of the tuberculous infection, and it is probably unwise to submit the child to any procedure which will lower its general resistance. These cases are best treated along general lines, with some form of radiation, preferably heliotherapy.

Some years ago the good reports of surgery in this field popularized this form of treatment. Almost anyone with a medical degree undertook the operation. Many of these so-called operations consisted in the removal of a few tuberculous glands, many more being left behind. In other cases a broken down superficial node was incised, and the cavity curetted, no attention being paid to the many tuberculous glands beneath. Lack of anatomical knowledge resulted in injury to important structures in the neck. The "recurrences," were many after these badly performed operations, and this, and frequent nerve injuries with paralysis and deformity, brought the operation into disrepute.

Dr. Dowd,[16] the leading American authority on this subject, who has recently made a study of 687 cases operated on by him and his associates over a period of more than twenty years, states that as these children come to him at St. Mary's Hospital they expect a cure in 85 per cent. of cases from the first operation, and in a large percentage of the remainder a cure following a secondary operation. Some of his cases have been followed over a period of twenty years. He states further that, "The operation is tedious, requires a very accurate anatomic knowledge, and is generally avoided by the busy surgeons who are in charge of the large hospital services. They are very willing to refer them to the younger men, or turn them over to any form of treatment which offers a fair prospect of success. It is particularly unfortunate that in doing this they have condemned many children to forms of treatment which offer little prospect of satisfactory cure."

Sir Harold Stiles,[17] a conservative surgeon of undoubted ability and honesty, who has a very large experience in the treatment of this condition especially in children, writes as follows: "Lack of knowledge is often responsible for unnecessary injury to important structures; for recurrence—due to incomplete removal of the disease; in short, for bringing into discredit an operation which is performed too seldom rather than too frequently, and which, moreover. is often too long postponed."

The majority of cases that come to us at the Children's Hospital are already far advanced. with extensive involvement of the deep glands, in which caseation and suppuration have taken place. Many of them have discharging sinuses from previous incomplete operations. Could these patients be operated on early when the nodes at the angle of the jaw only are involved, the results would be much better, the operation not nearly so extensive, and the scar scarcely noticeable.

The general plan of the operation has been fully described by Dowd[16] and others, and requires no detailed description. It is my practice to have a sterile preparation done the evening before operation, whether discharging sinuses be present or not; the hair being shaved from behind the ear and down the back of the neck for about one and a half inches from the hair line. The towels are removed in the operating room and the field painted with iodine. The incision should follow the natural crease of the skin, and should be a finger breadth below the mandible to avoid the lower branches of the facial nerve. In extensive cases a scond incision may be necessary, parellel to the first. Strict asepsis is necessary to obtain the best results. Sterile skin towels are clamped on the edge of the incision. This has the disadvantage of obliterating the landmarks to some extent, but to an operator familiar with the anatomy of the region, is not a real difficulty. I no longer put in a drain in any case. If there is much soiling of the operative field with pus from broken down glands, I sometimes swab the wound with iodine before closing it. It is essential that all haemorrhage be stopped. The incision is closed with a deep subcuticular silkworm gut taking up the platysma. An intradermal suture of No. 00 plain catgut followed by a collodion dressing completes the operation. The child is placed in bed with a sand-bag on each side of the head to keep the part at rest.

Conclusions

From a study of the literature and from my own experience the following conclusions seem justified: The faucial or pharyngeal tonsil is the portal of entry in the majority of cases of tuberculosis of the lymph nodes in children, and should be removed in every case. The majority of cases of this disease in children are due to the bovine type of infection. The probability of a mutation from the bovine type of tubercle bacilli to the human type renders early infection a matter of serious moment. The testing for tuberculosis of all cows supplying milk for human consumption should be made compulsory. The sale of unpasteurized milk from any but certified cows should be prohibited. It is desirable that sufficient hospital and sanitarium accommodation be provided for spreaders of tuberculous infection. and that provision be made for the care of children from homes where tuberculous individuals live. In cases where the disease has not spread beyond the cervical nodes. radical operation with the removal of the portal of entry. if possible, is the surest and safest method of effecting a permanent cure.

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SOME USES OF RADIUM IN DISEASES OF WOMEN*

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In dealing with a substance such as radium and its application in medicine, we must remember that it is only a little over twenty years since its discovery by the Curies working in their laboratory in Paris. Because of its scarcity and expense, it has been inaccessible to the vast majority of patients and physicians, and our knowledge of its value and its uses has in consequence been much hindered. Having regard to this, I thought that it might not come amiss to take up a few minutes of the time of this section in the presentation of some points relative to its application in some of the diseases peculiar to women.

To the public, and perhaps to many of our own profession, radium is almost exclusively associated with the treatment of malignancy in its various forms. We cheerfully grant that if its value as a remedial agent were confined to this dread scourge, it has achieved a place in our armamentarium, comparable with any of the discoveries of recent years. But we are convinced, from a knowledge of medical literature and a limited personal acquaintance with its uses in gynaecology, that it has gained a place in the treatment of those diseases which, while not so hopeless as malignancy, still are baffling in our attempts to secure results satisfactory alike to the patient and surgeon.

To digress for a moment, may we be permitted to say that whatever the opinion of our radiological friends may be, its application in gynaecology should be directed by one familiar with the pathology of the pelvic organs. It is not without its dangers, and so far as our present knowledge goes, it has distinct limitations.

For convenience of discussion, we have chosen to divide its application into those diseases that are non-malignant and those malignant. Of the non-malignant, we have:—(1) the menorrhagias; (2) the haemorrhages of the climacteric; (3) the fibro-myomata; (4) the pruritus vulvae and cervicitis.

Of the malignant, we have:—(1) uterine cancer; (2) cancer of the vulva; (3) cancer of the urethra.

So far as our present knowledge goes we believe the normal flow of blood from the uterus is regulated by the activity of the ovary and the increase in flow in menorrhagia is probably the result of interference with the proper functioning of that organ. When we come, then, to consider the treatment of this abnormality with radium, it is not merely the local condition in the uterus which we must consider, but more particularly the secondary effects in the ovarian tissue.

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*Read before the section of Obstetrics and Gynaecology at the annual meeting Ontario Medical Association.

Menorrhagia in young women.—Having this in mind, let us consider first that type of menorrhagia found in young women during the second decade. Profuse menstruation, often prolonged, painful and sometimes showing a good deal of neuro-psychic disturbance; added to this there is a progressive anaemic state almost always present. In these patients the judicious use of moderate doses of radium has proved beneficial in shortening and regulating the period. Objection has been urged that you endanger the fertility of the ovary. Undoubtedly if massive doses are used, the Graaffian follicles will be destroyed and a permanent menopause established. Recent research in rabbits rather points to the fact that fairly full doses of radium have only a slight effect upon the fecundity of the ovary in young life, and we think experience justifies this statement. W. P. Graves says, "In our earlier cases, we were greatly apprehensive of establishing a complete menopause in these young girls, but our experience seems to prove that the younger the ovary the more difficult it is to stop the menses by radiation." Hence it would seem that with reasonable care, this type of case can be treated with confidence.

A second variety of haemorrhage which we class with the menorrhagias is that seen in comparatively young women following a full term pregnancy or miscarriage. There is pronounced haemorrhage and sometimes metrorrhagia. There is some thickening of the endometrium; the uterus is sub-involuted; the ovary is oftentimes enlarged and tender with the occasional presence of small cysts. Treatment here should be on ordinary surgical grounds. We are here dealing no doubt, with an infection of a low virulency, and the ordinary surgical and hygienic treatment should be followed. If no specific trouble is present, good results are usually obtained. Some of these cases, however, in spite of all that can be done, persist in bleeding profusely at the period. In these cases radium can often be used to good advantage in controlling and regulating the menstrual flow. We have in mind of course, always the contra-indication for radium in recent or old infections of the adnexa and would not use it where evidence existed of gross inflammatory reaction.

Haemorrhage at climacteric.—In our second division we have placed that form of uterine haemorrhage that is found in women about the time of the climacteric. Some of the most alarming haemorrhages we have ever seen, occur at this time. We remember a patient brought into the hospital, who had been having uterine haemorrhages for weeks, and in whom the haemoglobin was only 30, and her red blood count, 1,100,000. Transfusion had been resorted to without much permanent success. The uterus was enlarged and hard, with regular and smooth outline. Radium was applied together with general treatment. This case had no more haemorrhages and gradually improved, and is to-day able to attend to her usual household duties. This represents, in our experience, a common type of diseased uterus, *fibrosis uteri*. Marked increase in the fibrous element, and interference with the normal blood control of uterine body, probably play their part in producing the menorrhagia. Examination of the endometrium shows marked hyperplasia. In these patients, the period is much prolonged, with marked increase in the quantity of blood lost, and uncertainty as to onset; hence they are always uneasy about themselves. They suffer from increasing evidences of anaemia, associated with the neuro-psychic symptoms often present at this time. Notwithstanding all we may do in the way of tonics, rest and hygiene, these patients frequently drift into a state of semi-invalidism. Thorough curettement with judicious application of radium will, in the large majority of cases, cure your patient. The haemorrhage either ceases altogether or is brought back to normal type. In our experience, there is no class of case that responds to radium with better success than this. With your pathological report you can assure your patient in the majority of cases that no malignancy is present, but if, on the other hand, cancer be found you are in a position to deal early and sometimes effectively with the disease.

Fibro-myomata.—The third variety is the fibro-myomata. Closely associated with the above class comes the fibro-myomata. In many of these enlarged, hardened uteri, we have intramural fibroids. A good deal of the differences of opinion with respect to the use of radium in gynaecology, circles about its use in this particular class of case. There are undoubtedly many fibro-myomata that should not be treated with radium. A study of the large number of cases reported by J. G. Clarke, Miller, Crossen, Polak, and others, shows well the range of treatment. Small fibro-myomata in women over forty, with no adnexal involvement, respond satisfactorily to treatment where haemorrhage is the dominant symptom. Here the menstrual function is not the important factor it is in younger women, and consequently freedom can be exercised in the use of radium.

Fibroids giving trouble during the 3rd and 4th decade come in a different class. It is here highly undesirable to disturb the menstrual function, hence surgical interference is the better treatment, if treatment is necessary. Myomectomy is a satisfactory operation and does not endanger the possibilities of pregnancy in the same way that a dose of radium sufficient to destroy the fibroid would in all probability do.

Small fibroids not giving trouble should, in our opinion, be left alone, but kept under observation. Large pedunculated or soft fibroids should be treated surgically. The rapidly growing tumour should only be considered surgically, in view of the fact that in about 1% or 2% of fibroids, cancer is found. Further, the possibility of sarcomatous changes in the fibroid must be remembered, particularly those of the submucous variety; as high as 9% of this type have been reported sarcomatous. Careful curettage should be a preliminary operation to the application of radium in all cases where it is to be used intrauterinely. The pathological report should determine any subsequent treatment. If cancer is present surgery and later, radium, or x-ray should be resorted to. In the large fibroids where surgery is the elective method of treatment but where, from repeated haemorrhages, hysterectomy is contra-indicated, radium can often be used with very satisfactory results. The bleeding can be controlled or stopped and the patient given an opportunity to get into safe physical condition for operation.

Pruritus Vulvae is another condition that is oftentimes baffling to the physician. Like many other diseases, the causation of which is unknown, many remedies have been suggested, some of which are more or less successful. The application of radium has been advocated and practised to a certain extent, and we are glad to know, both from literature and personal experience, that some success has been attained. As many of these cases are in patients nearing the climacteric, one can use radium or x-ray with comparative freedom, and in those cases where no definite cause for the disease can be found, we feel that the thorough application of radium should be followed.

Leucorrheal discharge from an endocervical infection is one of the most annoying conditions which a patient has to bear. Various forms of operative treatment have been devised with varying results. It is gratifying, therefore, to note that favourable results are being reported from the use of radium.

Curtis of Chicago, together with other workers, reports a considerable amount of work done and with sufficient success to warrant the investigation of every case of persistent leucorrhea with a view to radium treatment. In our experience, a large number of these cases occur in comparatively young women so that non-interference with the menstrual function must be kept in mind. A valuable factor brought out is this, that cases heretofore sterile have become pregnant after the elimination of the infection by radium. It is quite true the same results occur after some plastic operation upon the cervix, but if we can attain equally good results without operation, the number of patients who will submit to treatment will be increased.

Uterine Cancer.—Perhaps nowhere else than in cancer of the uterus has radium been used with more striking results. Much diversity of opinion is found with respect to its use in this most distressing disease, but out of it all, we are gradually reaching some well accepted rules in its use. Among those who have given attention to radium therapy in carcinoma of the uterus it is recognized that only in the cervical form of the disease should it be employed. In the fundal type, the results from total hysterectomy have been so good that, only in those cases in which, for other reasons operation is contra-indicated, should radium be used. In cancer of the cervix, we are dealing with a much more virulent type of the disease, and unfortunately many of the cases when seen first are too far advanced for any operation. Cases of this kind are unquestionably best treated with radium and x-ray. Oftentimes one sees what would be considered a hopelessly advanced case clear up and after a few weeks scarcely any trace of the growth can be found. Unfortunately this is not the rule, but practically all these cases can be benefitted by stopping haemorrhage, destroying necrosed tissue and thus eliminating the very offensive discharges which are present. Pain is relieved and the general morale of the patient, which is so important a factor, very much improved. In a series of 412 inoperable cases published by Dr. J. G. Clarke, he reports 20% living after four years, and 19% after the five-year period. In this type of the disease these results compare very favourably with surgery, with this advantage that you have no primary mortality. The use of radium here is practically free from danger, and your patient is saved the trying days of convalescence from a severe, mutilating operation, the shock and devitalizing effect of which goes a long way in producing a condition favourable to early recurrence.

There is a borderline case where the surgeon is in doubt. Here the disease has passed in some direction beyond the cervix, adjacent tissues are involved, some degree of fixation of uterus is present and the exact pathology cannot be determined until the abdomen is opened. Here we believe the results of radium are quite comparable with surgery and there is a growing belief in the mind of many that this class of case should also be turned over to radium therapy.

In recurrent cases and in cancer of a retained stump, radium would seem to be the treatment of choice, or radium plus x-ray.

In the very early cases where the disease is localized and no attachments formed with neighbouring structures, surgery should be the method of choice, because here you have an opportunity of making a clean dissection of the pelvic organs and glands. It would seem logical to follow up these cases with x-ray or radium, preferably x-ray, as then the wider lymphatic field can be reached and isolated cancer cells destroyed. There is another factor which must not be lost sight of in dealing with all forms of menstrual disturbance about the menopause, and that is, the patient will come earlier and submit to treatment more readily when she sees before her a plan of salvation that does not involve a serious operation with its attendant high mortality. We feel that this is a very important point and cannot be too strongly stressed, particularly in view of the very high cancer mortality in our land and the propaganda waged against it. Further we must be honest with these unfortunates. While holding out a ray of hope we must intelligently point out to them that radium is not a panacea for cancer but a valuable addition to our present armamentarium, and with it, we can with increased confidence attack this fatally destructive foe of our race

In *cancer of the vulva* not much success has been attained with radium. If the lesion is seen early when it is confined to the labiae, removal of the parts together with dissection of the inguinal glands would appear to be the safest course. The subsequent application of radium plus x-ray would seem logical in that any cancer cells lying in the lymphatics might be destroyed. In the advanced cases radium should be tried, together with x-ray, rather than attempting any surgical intervention.

Cancer of the urethra arising from urethral caruncle is a rare condition. Only some 69 cases have been reported; consequently, little information is available with respect to the use of radium. The author had experience with only one case and here wide dissection was made of the labiae and the anterior portion of the urethra and vaginal wall. Radium was then applied. As to result, we can offer no opinion at the present time. We would be inclined, however, to believe that these cases if seen early enough, should be submitted to radical operation with dissection of inguinal glands, following the same procedure as in cancer of labiae. Afterwards the use of radium and x-ray would, no doubt, be justified. In passing, we might emphasize the fact that urethral caruncle, while usually a harmless growth, has in some cases proved potentially a very virulent type of cancer.

Leukoplakia of the labiae and introitus offers a field for the use of radium. As this condition is oftentimes a precursor of cancer, we believe that radium should be given a thorough trial. It is interesting to note that very good results are being reported from this treatment.

In conclusion, let us say that while much of the work is yet in the stage of investigation, a great deal has been done towards the attainment of a permanently accepted therapy and time enough has elapsed in the work of many, for them to have reached definite conclusions with respect to the end results.

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The Diagnosis and Management of Stones in the Common Duct.—In 273 gallbladder and duct operations on 271 patients from 1917 to 1922, William D. Haggard, Nashville, Tenn., found a stone in the common duct in seventeen of thirty-three other operations for stone in the common duct prior to 1917, and in the thirty-three cases seen after this time, the mortality was 10 per cent. Thirty-six per cent. of the patients had a history of typhoid fever, and 18 per cent. were treated for what they called "typhoid malaria." The onset began with the characteristic colic in 90 per cent. of the cases. Eight per cent. began with indigestion only. There was a history of chills in 81.1 per cent of the cases. Fever of some degree occurred in practically all of the cases. Jaundice of varying degree, from one to many attacks, occurred sometime during the illness of 90.3 per cent. There were 90.3 per cent. who had soreness and tenderness in the right upper quadrant which varied from an exquisite to a very slight tenderness which it was hard to elicit. More than half of the patients complained of indigestion between attacks. At operation, the common duct was sometimes enormously dilated and completely filled with stones. The duct was dilated in the great majority of cases. In nearly half of the cases, the gallbladder also contained stones.—*Jour. A. M. A.*, Sept. 1, 1923.

Pancreatitis as Related to Gastro-Intestinal and Gallbladder Infections.—From clinical experience Seale Harris, Birmingham, Ala. was convinced that a damaged pancreas, either from infection or from trauma, may be the active predisposing cause of diabetes. To prove this assertion four cases are cited. Diabetes is a disease characterized by impairment of the function of the insulin-forming glands in the islands of Langerhans,and is due primarily to trauma of the pancreas, or to a pancreatitis. Infections of the pancreas are usually secondary to lesions of the other abdominal viscera, though other foci of infection, as the teeth and tonsils, may be the primary cause. In treating diabetes, the primary cause of the disease should be sought for and removed, if possible. A deficiency diet is the predisposing cause to the intestinal lesions which seem to be an important source of infection in pancreatitis. An educational campaign teaching the public the importance of a diet containing the proper amounts of carbohydrates, fats and proteins, as well as sufficient vitamins and the essential mineral food constituents, Harris believes, would prevent diabetes to a large extent. In the treatment of diabetes, due regard should be paid to the vitamin and necessary mineral constituents of food.—*Jour. Am. Med. Ass.*, Nov. 3, 1923.

THE OBSTETRICAL CAUSES AND PREVENTION OF STILLBIRTH AND EARLY INFANT MORTALITY

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As a general rule, the problems of the causation and prevention of maternal morbidity and mortality so overshadow the question of the loss of foetal and infant life, in the eyes of the obstetrician, that this aspect of one's duty to the community is often lost sight of. This fact prompted the writing of this paper, which is compiled from the records of the Obstetrical Department of the Toronto General Hospital for the five years 1918-1922, including all cases of stillbirth after the period of viability had been reached, and also any infant deaths occurring during the first two weeks of extrauterine life. These figures include both public ward patients under the care of the obstetrical staff of the hospital and those private cases confined in the Burnside Hospital by others, not 'on the visiting staff.

Attention might be drawn to the fact that the percentage of abnormal cases is always higher in hospital practice, and also that a considerable number of patients are sent into the hospital after a condition has arisen which absolutely precludes the possibility of a successful termination of the labour.

During the five years under review there were 4,492 births in the hospital, with a total of 387 infant deaths including stillbirths, which is a mortality of 86.1 per 1,000 births. It is of interest to compare these figures with those for the Province of Ontario for the year 1921 where we find 77,618 births with 6,572 infant deaths and stillbirths—a rate of 84.6 per 1,000 births. This is a very close parallel indeed. These statistics give food for a good deal of thought, because one must admit that the loss of many of these young lives is due to causes which are preventable.

To clarify a mass of statistical material I have attempted to divide the apparent causative factors of death into four groups. The first group contains all those deaths for which no assignable cause could be found. The second group is made up of those deaths due to causes developing during the ante-natal period. The third group includes deaths which occurred during parturition, and the fourth, those deaths from causes developing post partum in cases in which the pregnancy and the labour had apparently been normal. There were 114 deaths grouped together as unpreventable. All are familiar with the stillbirth or the early death of infants for which one cannot determine a cause, manifested either clinically or pathologically. There were thirteen such cases. There were thirty-three cases of malformations, including hydrocephalus, anencephalus, spina bifida, extrophies and other monsters. This is apparently in excess of the proportion of these conditions reported from other centres.

There were 15 macerated stillbirths, which were not due to syphilis and for which we could find no cause, and 53 premature stillbirths or living births which lived only a matter of a few days, and for which also, no cause could be determined. There were 89 deaths grouped together as due to ante-partum conditions. Maternal syphilis accounted for the largest number of these, namely 30. We know that active anti-syphilitic treatment during the pregnancy will often result in the birth of a perfectly healthy child, and where it is possible to commence treatment prior to the onset of pregnancy, one may hope for an even greater result in preventing the hereditary transmission of this dread disease.

Eclampsia accounted for 26 deaths, this figure including prematures due to eclampsia. The doctrine of proper ante-natal care has been disseminated so widely that there is no necessity to go further than to state that we have been able practically to stamp out eclampsia amongst the patients who attend our ante-natal clinic.

Twenty-five deaths were due to maternal toxaemias, which did not progress to the point of convulsions. The patients for the greater part had been under supervision and as a result were on restricted diets with forced elimination. But in spite of this there was a large toll of infant life and as we now know, many of these mothers never completely recover from this type of toxaemia and are liable to exacerbations of what may be considered a latent condition with each subsequent pregnancy, and with a consequent series of stillbirths as a result. It was especially during the influenza epidemic that we noted the effect of an overwhelming of the maternal organism by an acute infectious fever. In nine cases the child was stillborn, or lived for a few days at the most. Several of the mothers were *in extremis* at the time of delivery; a few survived the labour and eventually recovered.

Now we come to consider our largest and, from the obstetrical viewpoint at least, our most important group, namely those deaths consequent on some complicating factor of parturition. One hundred and fifty-nine cases are classed together. These we shall discuss briefly, attempting so far as is possible, to bring them into definite groups according to the principal contributing factor, although it will be noticeable that there is some unavoidable overlapping.

Difficult labour consequent on malpresentations is an ever present problem, breech presentation accounting for eighteen infant deaths, excluding prematures. As is well known, a certain incident mortality must be looked for in such cases, especially in primiparae. But we cannot help but feel that the loss of life will vary directly with the skill of the accoucheur. Certain practical points in treatment which one may be pardoned for referring to are:—

(1) Attempt to preserve the bag of water as long as possible.

(2) Make an examination as soon as the membranes rupture, so that the type of breech presentation may be determined and the legs brought down in the case of a frank breech.

(3) Try to deliver only when the cervix is fully dilated. A bag may be advantageously used in some cases to accomplish this.

(4) Use the Potter method of "ironing out" the lower vagina and perineum, and in case of primiparae, perform an episiotomy.

We note sixteen infant deaths in cases of transverse presentation. These were invariably neglected cases sent in from outside at a period when the chance of the child surviving was practically beyond hope. The treatment of preference would be early version where the pelvic measurements are not too restricted, without delivery until the cervix is dilated, otherwise Caesarean section.

Four cases of face presentation were lost. In all the chin was posterior. Ordinarily such a condition terminates favourably, the old, sound obstetrical axiom of "watchful waiting" being the key to success. However, occasionally, either as a result of poor uterine contractions or incomplete extension of the head, rotation of the chin to the front fails and it is necessary to supplement the efforts of nature, either by manual rotation and forceps delivery or else version. Remember always that the face is a poor dilator of the cervix and an undilated cervix is a very real complication.

Occipito-posterior position has not been listed as an entity, because these cases are all dealt with under various other headings, such as "contracted pelvis," "prolonged second stage" and "difficult mid forceps delivery," but to complete this sub-group I make mention of it here and state our idea of the treatment of such a case to be:—

(1) Sure diagnosis of the condition by means of feeling the direction of the ear with the half hand in the vagina if necessary.

(2) Watchful waiting.

(3) Manual rotation and delivery, if indications warrant this procedure.

(4) Forceps to a persistent occipito-posterior if this fails.

Our second sub group includes those cases where forceps were used in delivery. So called "high forceps" were applied on thirty-six occasions, resulting in the death of seventeen babies. Such an operation we would practically never attempt for the reason that in this country contractions are almost invariably at the inlet of the pelvis, and a head which will not mould, can practically never be pulled through without lasting damage to the child and to the mother herself. In four cases the forceps were even applied before full dilatation of the cervix, which is a manoeuvre open to the severest criticism. Ten cases of high forceps were in contracted pelvis; in three, version had to be done to accomplish delivery, and in two, craniotomy had to be resorted to.

Seven deaths occurred in cases where difficulty was experienced with a mid forceps application; these may in contradistinction to the others, be looked upon as legitimate forceps deliveries. In several the occiput was to the rear; in two, the face was presenting; and in all there were definite indications for immediate delivery. The points to be learnt from these cases are—that in any case calling for the application of forceps, except to simply lift the head over the perineum, we must expect a certain loss of infant life; the delivery must not be delayed too long; close attention is demanded to the condition of the child by auscultation of the foetal heart sounds.

Fourteen deaths were directly or indirectly to be attributed to contracted pelvis. Proper antenatal examination with pelvimetry and supervision might have prevented some of these. The method of attempted delivery was, however, open to question in several instances. For example, two cases of Caesarean section ended fatally for the baby because the operation was delayed too long. One cannot condone a procedure which at the same time exposes the mother to the gravest danger and results in the infant's death. Mention has already been made of the use of high forceps. Five deaths resulted in cases in which version was done. Prophylactic version undoubtedly has its place in the treatment of contracted pelvis, but must be used with discretion. The operation is always to be considered as a two-stage manoeuvre; first, version; and second, extraction; the latter should never be attempted unless the cervix is fully dilated.

Ten cases are grouped together in which there was a prolongation of the second stage beyond the normal; that is, either four hours after full dilataion of the cervix, or the presenting part left on the perineum for more than an hour and a half. In six cases low forceps were applied; in two cases pituitrin was given without avail. The lessons to be learned from these catastrophes are simply:—(1) That a close watch of the foetal heart by means of a stethoscope would give sufficient warning to save life in many cases; (2) that an "ironing out" of the perineum, or episiotomy, might simplify delivery and might not subjugate the foetus to the added pressure consequent on the use of forceps, or pituitrin given to effect delivery in the face of an unduly resistant perineum, a complication of more than rare occurrence.

In another sub-group there are listed six deaths, in which the labour had been precipitate. Ordinarily when a precipitate labour is spoken of, one thinks of an extremely rapid and easy labour accomplished often before the arrival of the doctor. But there is also the patient who, sometimes when stimulated by the use of pituitrin and sometimes without any stimulation, goes through a short tumultuous labour, in which the pains follow one another with almost tetanic force and activity. We also mention at this point, seven deaths in cases in which, judging from the evidence, one concludes that an improper use of pituitrin was responsible. Four of these cases were also listed as precipitate labour. In either case a proper obstetrical anaesthesia could have controlled the pains and very probably would have prevented the loss of life. Pituitrin is a drug which must be used with discretion. It is our routine practice to induce labour with it, and when properly handled it is without danger to either the mother or the child. The dose must be guarded, however, ¼ c.c. being sufficient as an initial start, because of the idiosyncrasy which some patients show to this drug. Again it should never be used to strengthen pains which are already strong, nor to drive the foetal presenting part against either a bony or a fibromuscular obstruction.

While speaking of proper obstetrical anaesthesia, a death might be noted in which the baby could not be resuscitated after a chloroform and ether anaesthesia of five and a half hours. Either the anaesthetic was begun in the first stage or else a prolonged second stage went unrecognized. One cannot help thinking that the foetal heart was probably not watched.

A rather large number of deaths were due to ante partum haemorrhage. We find thirty-five deaths in cases of placenta praevia, an infant mortality of over 50%. The majority of these children, however, were premature. The death rate was seen to be in direct ratio to the severity of the haemorrhage. Those forms which called for the major methods of treatment such as Caesarean section, version, or the insertion of a bag, were much more frequently fatal than the cases which were treated by packing or simply rupture of the membranes.

Accidental haemorrhage accounted for seventeen deaths. Again, prematurity was an added complication. But this condition is, if at all severe, a matter of such grave portent maternally, that the child is hardly to be considered at all.

We note nine deaths where the cord was prolapsed. Prolapse of the cord must be looked upon as merely the result of improper or non-engagement of the presenting part. It is rather to be expected in all those cases of malpresentation or where the presenting part is found floating above the brim. It is our practice, therefore, to examine such a case either vaginally or rectally, immediately on rupture of the membranes, to determine the occurrence of this complication, because if treatment is called for at all, it must be undertaken immediately. For in those cases where the cord is found prolapsed on accidental examination, the child is generally already dead and treatment can be of no avail.

In two cases, after the use of morphine, the baby was born in a state of deep narcosis from which it could not be aroused. One was the result of the improper use of morphine and hyoscin. In the use of these drugs there can be no rule of thumb, each individual being a law unto herself, and the greatest watchfulness and judgment is to be exerted to avoid catastrophes of this kind. The other death was in a case of Caesarean section, in which case the mother had been given morphine gr. ¼ twenty minutes before the birth of a slightly premature baby.

It is to be noted that in four cases the child was stillborn with the cord tightly wound two or more times about the neck. There appears to be a diversity of opinion as to whether such an accident could be wholly responsible for the loss of the child's life. The finding was, however, definite, and the life was lost.

A condition which fortunately rarely presents itself, occurred but once and was fatal in its outcome, namely, impaction of the shoulders. As a general rule one is able to overcome this obstacle by traction either with the finger or a blunt hook, aided occasionally by episiotomy. Sometimes, however, we fail.

The last group to be considered contributes twenty-five deaths. The largest number was due to pneumonia, which accounted for seven of the total. There is no need to enlarge on the gravity of this disease in the new born.

Haemorrhage of the new born was responsible for three deaths and these lives, it must be admitted, should not have been lost had transfusion been resorted to promptly; the marvellous results of this form of treatment are well known to all. Cerebral haemorrhage following normal labour caused death in three cases, and this is to be considered, according to most modern authorities, as simply a form of haemorrhage of the new born. Too often in the past and unjustly, has the obstetrician had to bear the blame for the development of this unfortunate condition.

Four children gave clinical evidence of congenital heart lesions and autopsy confirmed the diagnosis. Two full term babies were atelectatic and died as a result of the condition; the cause of atelectasis is as yet unknown and treatment is of no avail.

Two children died of cord infections, and two of peritonitis. For one case of peritonitis no cause could be found. The other case developed from a perforation of the colon at the splenic flexure. One child, a twin, died of cerebro-spinal meningitis. This was considered to be an air born infection. Another child, whose mother suffered from a streptococcic puerperal infection, developed an ulcerative endocarditis from the same organism, and died.

There is simply this to be said in conclusion. Proper antenatal care would save many lives; by this we mean not only the guarding of the mother against toxaemias of pregnancy and preserving her general health, but the routine examination of the abdomen and systematic pelvimetry. Under these circumstances when labour actually begins we know with what we have to deal.

During the course of labour a sane procedure should be adopted. Meddlesome midwifery cannot be excused on any grounds. But on the other hand, to sit blindly by, in the presence of an impending disaster, is to admit a lack of knowledge of the fundamentals governing intelligent interference, which is, after all, the scientific application of the art of obstetrical surgery.

A CASE OF SEVERE DELAYED ANAPHYLAXIS

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Although occasionally, happily unusually, examples of acute anaphylactic phenomena occur in the human being following the parenteral introduction of horse serum for prophylactic or therapeutic purposes, such acute manifestations almost invariably follow the introduction of the antigenic protein, within a few minutes. The following type of case is believed by the author to be of sufficient rarity to justify its being placed upon record. I am unwilling to attempt to explain why the reaction was thus delayed, or, being so delayed, was so acute.

The patient, E. O., aged 26, son of a Montreal physician, was operated upon April 10th, 1923; tonsillectomy was performed by Dr. R. P. Wright, at the Montreal General Hospital. During the afternoon of operation, as some bleeding occurred, the patient received two intramuscular injections of "haemostatic serum" (5 cubic centimeters each). Soon after the injections were made several pea-sized elevations were noted in the vicinity of the needle puncture.

The only aspects of the patient's previous history which might be of interest are that when seven years of age a severe urticaria followed serum injection for suspected diphtheria. Antityphoid vaccination, at nineteen years of age for military service, was followed by a mild reaction without urticaria. The patient never suffered from hay fever or other asthmatic symptoms. The patient was a well-built, well-nourished, man with a somewhat highly-strung nervous system; otherwise examination prior to operation was negative in all respects. Following operation convalescence was smooth and uneventful, and on the 15th he left the Hospital in apparently good condition. Suddenly, while resting quietly at home on the afternoon of April 17th, at 5.00 p.m., there was an onset of itching; giant urticaria developed in different parts of the body, more especially the lips and ears. These symptoms were accompanied by severe weakness and nausea. At four o'clock the patient had partaken of afternoon tea, consisting of a cup of tea and sandwiches. About 5.40 p.m., the patient's father was informed by telephone that his son had "fainted." Upon arrival a few minutes afterwards he found general oedema and urticaria with great thickening of the lips, pulse 120, fair pressure, regular. He had been given about an ounce, partly wine, partly brandy. Shortly afterwards he vomited, became pale, and the radial pulse became imperceptible. An ampoule of 1 mil. adrenalin chloride, 1-10,000 with 7/100 grain chloretone, P.D.Co., was at once given by hypodermic injection and Dr. W. F. Hamilton was summoned. When Dr. Hamilton arrived the oedema had very considerably diminished and the radial pulse had returned. He approved of the epinephrin and advised sodium bicarbonate with water by mouth. We hoped that the attack was subsiding and the danger over, and he went home.

About one drachm sodium bicarbonate was given in divided doses with water to total of about fifteen ounces by mouth. At 7.30 p.m. explosive vomiting set in with epigastric and praecordial oppression. Dr. Wright came in about this time to see the patient, and found the pulse fair; but shortly afterwards patient became restless, complained of weakness, and his radial pulse again failed. Camphor, three grains in oil, was administered hypodermically. At eight o'clock the writer of this note received a telephone message and saw the patient at about 8.15, at which time the radial pulse was barely perceptible, the heart sounds showed a rate estimated at about 140 per minute. The patient did not appear comfortable unless being fanned. The urticarial oedema had largely subsided, although the upper lip was still much swollen, so much so that the patient had difficulty in breathing and complained of great praecordial and epigastric oppression; he repeatedly made the remark that he felt as though he was going "under an anaesthetic." A hypodermic injection of ½ cubic centimeter adrenalin chloride 1-1,000 was made, together with 1/100 grain of atropin. Calcium lactate, one drachm, was given by mouth between 8.15 and 9.15 in about eighteen ounces of water. About 9.45 he vomited. The radial pulse gradually improved, and about 10.20 p.m. it was judged that the patient was out of danger and he was left alone for the night with his father.

The following notes were made during the night by the patient's father: "At 11.15 p.m. patient became restless; oedema again increased; he again vomited and the pulse became weaker. One-half cubic centimeter adrenalin chloride 1-1000 was again injected hypodermically. The pulse again improved, the oedema diminished, and he voided urine three ounces (estimated), and afterwards slept about half an hour. 12.45 a.m., awakened with recurrence of oedema and itching, pulse 140. One-half cubic centimeter adrenalin solution was given as before. Small normal stool occurred, and he voided about one ounce.

"1.15 a.m., pulse 112. Less oedema. Has been taking about three to four ounces of plain water per hour.

"2.05 a.m.: Has slept about 20 minutes. Restless again, frequently trying to clear mucus from throat, pulse 124.

"2.15 a.m.: Says throat feels stiff, complains of difficulty in swallowing, respirations shallow and irregular, but no asthma nor stridor; oedema and itching recurring or rather increasing again as they were never absent, merely showing waves of greater or less intensity and diminishing after each hypodermic of epinephrin so that the itching was not complained of until the next exacerbation.

"2.23 a.m.: Cocaine 10 per cent., and adrenalin 1-1,000 to glottis, on applicator kindly bent and 'armed' by Dr. Wright. There was immediate relief of throat symptoms following this application and no recurrence took place.

"2.33 a.m.: Pulse 137. 2.57 a.m., vomited about 16 ounces, at first clear fluid, and later about two ounces chiefly mucus. Complains of bitter burning taste of vomitus and of constant 'heartburn,' and of praecordial and epigastric oppression. 2.52 a.m., pulse 127, resting quietly. 3.30 a.m., again on bed pan, no result, voided about ½ ounce urine.

"4.00 a.m.: Patient vomited about four ounces clear fluid mixed with mucus of yellowish tinge which he said tasted or smelled like feces; some streaks of *blood* in the *mucus.*. 4.05 a.m., pulse 124. Sodium bicarbonate twenty grains in water.

"5.00 a.m.: Patient again vomited about four ounces of mixed fluid and yellowish mucus. *Several small black clots* in vomitus. Commenced cracked ice in small bits in mouth at intervals of five to ten minutes, slept about half an hour between four and five o'clock. 5.05 a.m., pulse 122, resting quietly.

"6.35 a.m.: Vomited about two ounces mucus, yellowish tinge. 6.43 a.m., pulse 122, resting quietly. The urticarial appearance or wheals and large elevations above general surface not now marked; but lips still much thickened and arms and hands seem about double their proper size; face also was much swollen and scalp itchy."

No attempt was made to determine the patient's temperature as he was unable to keep his mouth closed on account of difficulty in breathing, and because restlessness and tossing about would have made axillary temperature of doubtful reliability. At no time did he suffer from chilliness, nor did palpation of the skin indicate him to be febrile.

During the night the patient had been left undisturbed on a chesterfield in the living-room where he first had been taken ill. The following morning, April 18th, the general condition seemed much improved, although he was weak and fearful of a recurrence of the symptoms. It was then judged safe and advisable to have him removed to the hospital so that he might be under close observation. During his stay in hospital (four days) he remained free from any alarming symptoms whatever. His urticaria gradually subsided, and he gained strength rapidly. On the fourth day he was discharged apparently well, and has remained so since that date.

Serotherapy in Scarlet Fever.—Paraf summarizes the work of Weaver, Zingher, Kling and others with injection of convalescents' serum in treatment of scarlet fever. His own experience with it was conclusively favourable, he says, in a case of malignant scarlet fever in a child, the only one thus treated. —*Bulletin Medical*, Paris, Aug. 4, 1923.

TREATMENT AND GENERAL MANAGEMENT OF ECZEMA IN INFANTS IN PRIVATE PRACTICE*

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BEFORE entering into the description and management of eczema in infants, it might be well to state briefly the underlying causes. Anyone who has had to do with large numbers of eczematous or exudative diathesis infants, as they are frequently called, will be struck with their general abnormal behaviour to both food and infections. They are frequently referred to as generally susceptible children, not only to infection or inflammation of the mucous membranes as head colds and their complications, but to many skin manifestations such as eczema and furunculosis. The various organs show symptoms of the trouble, sometimes the digestive tract, lymphatic, bony and even the nervous systems. The great difference between the exudative diathesis child and the normal one, is that the former is abnormally constituted from a cellular standpoint, his immunity is lowered, his skin surface is easily irritable, his food tolerance is much reduced, especially for fat and carbohydrate, while in many cases their abnormal cellular constitution and altered reaction to food makes them peculiarly susceptible to certain ingested proteins producing eczema, asthma or urticaria.

In dealing with one of the chief manifestations, viz. eczema, of this so-called diathesis, one has to constantly bear in mind this underlying pathological condition. Generally speaking, eczema may be divided into two broad types, (a) the exudative or wet type most usually observed in fat breast-fed infants, and (b) the dry type more commonly seen in the artificially fed undernourished child. The condition usually does not manifest itself before the first month and shows a tendency to spontaneously disappear after the first year, though many, however, persist for years after this.

The exact underlying causes or processes which take place are, as indicated previously, not clearly understood, but there are certainly three factors which are directly operative in producing the condition.

(a) Overfeeding with either fat or sugar, or both of these ingredients.

(b) Local irritation.

(c) Anaphylactic idiosyncrasy to foreign proteins (most commonly lactalbumin, egg-white, casein or beef protein).

The therapeutic remedies that we have at our disposal are based generally upon these three causative factors.

The Food.

(*a*) *Breast fed infants.*—When eczema occurs in breast-fed infants it is most usually found in the fat well-nourished type of infant who has been grossly over-fed on a 2 or 3-hour interval. The infant besides having eczema shows the ordinary signs of dyspepsia or overfeeding such as loose, frothy stools with a good deal of colic and gas. I have never been convinced that either the fat or sugar ingredients were directly the cause; rather is it due to overfeeding probably with all of the ingredients, and the symptoms of colic, etc., produced by excessive fermentation of the abnormal carbohydrate intake. I should like to utter a warning here that under no circumstances should the infant be weaned, for the task of supplying artificial nutriment makes the problem doubly difficult. Briefly then, in breast fed infants the task is that of reducing the food intake by one-third or even one-half and nursing the infant every four hours. In many cases it is necessary to still further reduce the fermentation by the addition of half to one ounce of protein milk before nursing; as the skin condition improves the food intake may be cautiously increased to the infant's nutritional needs. It is always wise in circumstances such as this to encourage the mother to empty her breasts, otherwise she may lose her breast milk entirely; this is an important detail which should never be overlooked. Very occasionally does one see a dry scaling eczema in a breast fed infant, and then it is only in one who has been receiving insufficient nourishment; the problem is then one of re-establishment of breast milk and supplying the deficiency. In addition to the above measures I have found it wise to give about 30 grains of sodium bicarbonate each day in the infant's drinking water, which is usually sufficient to keep the urine alkaline.

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*Read before the Section of Diseases of Children of the Ontario Medical Association, June, 1923.

(*b*) *Artificially fed infants.*—Here the situation is doubly difficult because one has to deal with two problems, one, a great one, of undernutrition, and the other the local condition, which is usually of the dry, scaly type on the face and extremities. There is no doubt in my mind that excessive amounts of fat and soluble carbohydrate (sugar) exaggerate the condition in every instance. In the mild cases it is permissible to employ full skimmed milk and to make up the required calories either with barley, granum or groats flour which is cooked in with the 30 grains of sodium bicarbonate. This type of food is deficient in both the anti-scorbutic and the anti-rachitic accessory food factor; the former may be supplied if necessary by small doses of orange juice (provided the infant does not react to it with an increase in the eczema, then of course other anti-scorbutics must be added such as tomato juice or potato water), and the latter by pure cod-liver oil, to which I have never seen an infant react. I am firmly convinced that all sugars are more harmful than the fats, and have, therefore, made it a routine to omit the former from the dietary of eczematous infants.

If the eczema is moderately severe I am in the habit of discarding plain cows' milk entirely and using St. Charles Brand evaporated milk which is ordinary cow's milk evaporated 2 2/10 times and then homogenized. It should be borne in mind that the caloric value of this milk is twice that of plain cow's milk. This milk is modified in the same manner as has been mentioned above with the skim milk, *i.e.* the starch is added and cooked. Here again the accessory food factors must be employed; with the use of evaporated milk one thus overcomes any possible chance of anaphylactic reaction with cow's milk.

Idiosyncrasy to Food Proteins.—In my hands this has been extremely disappointing, yet in a few instances it has produced gratifying results. At the present moment, however, I am not prepared to state positively that we might have had just as good results with the general dietetic and local measures without the knowledge of the skin tests. Only in rare instances did removal of the offending protein from the diet have any beneficial result. Of 228 tests applied in 35 consecutive cases under 2 years of age in private practise in the last two years there were only 30 positive results. Of the 108 cases not tested in the same period of time I think I obtained almost equally good results. The chief offending proteins in the series were as follows:—lactalbumin, casein, egg white, whole milk, wheat, potato, beef, barley, orange juice.

It has been customary when a positive reaction is obtained to omit the foreign protein from the diet—in those instances when lactalbumin, casein or cow's milk shows a positive reaction it is essential to use evaporated milk. In my hands evaporated milk has been more successful than any of the powdered milks.

In breast-fed infants occasionally one will obtain a positive reaction to some food such as egg, cow's milk, potato, or beef, which the infant has not had; the explanation of this is that the particular protein in the mother's diet is carried over in her milk, and if the offending protein be omitted from the mother's diet a decided improvement is sometimes observed in the local skin condition. In my series I have had several such instances, but I must confess that I used local treatment in addition, so that I am not prepared to state exactly how much benefit I derived from alteration of the mother's diet entirely.

Local Care.—If one is to achieve success in the treatment of infantile eczema infinite attention must be given to every detail. In the same patient one may observe several types of eczema, for instance there may be a seborrhoeic condition of the scalp, an acute weeping eczema of the face, a dry cracked eczema of the popliteal space and a diffuse papular eczema of the body—for this reason several different applications may be required for the same patient.

Generally speaking, eczema may be divided into the following types, as far as local treatment is concerned:—(a) Wet; (b) Dry acutely inflamed; (c) Dry and rough; (d) Seborrhoeic; (e) Eczema intertrigo; (f) Diffuse vesicular or papular; (g) Infected.

The following general remarks apply to the local care of all eczema. No water of any description should be used until all the eczema has disappeared, then two or three times a week a bran bath may be employed using a superfatted lanolin soap. Instead of the bath, the infant may be washed over with cotton dipped in olive oil, while if caking or crusting of any of the local applications occurs they may be softened with lanolin or vaselin. It is generally better, however, to let all the local applications wear off. If, after the eczema has disappeared there is a tendency to dryness or chapping of the face, a bismuth paste composed of: Bismuth subcarbonate 2 drachms, lime water Q.S. and anhydrous lanolin 2 ounces may be applied each time the infant goes out of doors and special care should be taken to see that the infant is not exposed to cold winds. All ointments used should be frequently applied, *i.e.* sufficiently often to keep the parts well covered. Special instructions should be given that no wool of any description comes in contact with the skin. In every instance scratching should be prevented with the use of aluminum mitts or a straight jacket.

(*a*) *Wet or Weeping Eczema.*—Most usually observed in fat, over-fed, especially breast-fed infants. It begins on the cheeks behind the ears and in the antecubital and popliteal spaces —beginning as acutely inflamed papules which coalesce and finally exude serum, and in a few days the face is oozing and covered with crusts.

For this type of eczema crude coal tar is almost a specific; there is no skin lesion in infancy which responds so readily to treatment as a weeping eczema does to crude coal tar properly applied. It is very important that the proper type of coal tar be procured. It is entirely different from the wood tar of the pharmacopoeia which has been so extensively used in skin lesions, especially eczema. This crude coal tar is a by-product in the manufacture of coal gas and may be obtained direct from the gas works or any large drug house. It should be of inky black consistency, thick so that it will scarcely run, and should contain no granules. This crude tar preparation should be applied over the raw surface with gauze on a wooden spatula two or three times a day. This treatment should not be rubbed off but repeated for 3 or 4 days and then allowed to wear off. After this is worn off the skin is red and smooth, showing no evidence of the original eczema. Following this a bland protecting ointment may be applied, such as the bismuth paste for which a formula has been given.

(*b*) *Dry and Acutely Inflamed Type.*—This is the most common type of eczema, observed almost on any locality of the body in large sharply defined or irregular patches, or in the form of red papules. This particular form of eczema is also most amenable to tar, only in a different form. The prescription as recommended by L. W. Hill, I have been in the habit of using as follows: take of crude coal tar 2 drachms, zinc oxide and powdered starch of each 2 drachms; vaselin sufficient to make 2 ounces; make an ointment. This is a thick, dirty green paste and should be applied to the face by means of a mask made of burnt linen. A liberal application should be made twice daily. If the eczema is present on the extremities the ointment should be applied on burnt linen, held in place with bandages. It should be borne in mind that tar contains a certain amount of phenol and that there is a danger of absorption if it is used over too large an area, especially if the surface is raw. I must confess I have never seen any harmful effects from repeated application of the tar paste to both the face and the extremities and even small patches on the trunk. If there is considerable thickening or scaling of the skin the addition of 10 grains of salicylic acid to the ounce of the tar paste is frequently beneficial.

(*c*) *Dry and Rough Eczema* (*not acutely inflamed*).—Usually tar is not necessary for this type; either bismuth paste or lanolin applied liberally several times daily will be sufficient. Occasionally some benefit will be obtained by the employment of small doses of thyroid extract. As an addition to the above mentioned ointment, and especially if there is considerable induration, salicylic acid should be added as previously mentioned.

(*d*) *Seborrhoeic Eczema.*—This type is usually seen in small infants. It shows itself very soon after birth and is frequently referred to as "cradle cap" or "milk crust." It consists of yellowish greasy scales or crusts over the fontanelle, frequently covering the entire scalp running down to the eyebrows and the bridge of the nose. All that is necessary is to instruct the mother to soak the scalp in olive oil at night with a bonnet, and in the morning comb off the scales with a fine tooth comb and rub in vigorously an ointment of 4 per cent. resorcin. Once or twice the scalp should receive a green soap shampoo. The resorcin usually has to be continued for some weeks as the scales form very rapidly.

(*f*) *Eczema Intertrigo.*—This form of eczema is most usually observed around the genitalia and inner surfaces of the thighs, it not unusually extends up over the abdomen and behind over the buttocks. It is an intense fiery red eruption usually associated with considerable thickening. It may appear in other localities such as behind the ears, axillae and folds of the neck; when in this location it is usually moist. The management of the eruption when it occurs on the lower abdomen and genitalia consists in protecting the parts from the irritating acid urine and also from the faeces. With this end in view, no diapers should be applied and a large pad of absorbent cotton placed so as to absorb the urine and faeces and all the parts exposed to the air in a warm room, the excreta being wiped off with cotton dipped in olive oil. To the regions should be applied several times a day or as necessary, the bismuth or tar paste mentioned previously, the latter being employed in the more severe cases. It is very important that enough sodium bicarbonate be given each day to keep the urine alkaline. The treatment of the intertrigo when it occurs in the folds of the neck, axillae, etc., differs somewhat. Care should be taken to keep the opposing surfaces apart by means of pledgets of absorbent cotton after first powdering the parts liberally with zinc stearate dusting powder.

(*g*) *Papular Eczema.*—This form is most usually observed in children over 18 months of age and consists of numerous dry, indurated, frequently scaling papules distributed well over the surface of the body especially on the trunk. The management of this type is again a little different; the infant is sopped well over with a thin starch solution which is allowed to dry on, and in the evening the tar paste is rubbed well into the skin. This process has to be repeated several times.

(*h*) *Infected Eczema.*—As very frequently happens especially in infants that are ill nourished, infection takes place very rapidly, especially in the region of the scalp. Ammoniated mercury ointment thoroughly applied over the infected areas is indicated, while if furuncles occur they should be opened in the usual manner and alcohol compresses applied. The scalp is in some instances literally covered with these furuncles, and for this nothing is more efficacious than continuous alcohol compresses.

Abdominal Surgery without Detached Pads and Sponges.—The essential feature of H. S. Crossen's, St. Louis, method is the substitution of a long gauze strip for the ordinary detached sponges, the greater part of the strip being always outside the abdominmal cavity. The strip is 10 yards long. Two strips are made by dividing the yard-width of gauze in the centre and folding each half longitudinally to six thicknesses. Each strip is therefore 10 yards long, about 3 inches wide, and has six thicknesses of gauze. For protection and convenience in handling the strip is packed into a small muslin bag, 5 inches wide and 10 inches deep. The end of the strip is stitched to the bottom of the bag, and the strip is then packed into the bag in such a way that it may be pulled out a little at a time, as needed. The filled bags are sterilized and are then ready for use. At operation, the bottom of the bag is clamped or pinned to the abdominal sheet, and the gauze strip is pulled out a little at a time as needed for sponging.—*Jour. Am. Med Ass.*, Nov. 10, 1923.

HEREDITARY SYPHILIS

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THE statement has been made repeatedly that there has been in the past, a gross exaggeration of the importance of syphilis as it affects infant and child welfare. I believe that such statements emanate either from those who are grossly ignorant of the widespread ravages of the disease, or from those who deliberately close their eyes to its seriousness. In any consideration of a disease which is so varied in its clinical manifestations, which is so resistant to treatment and to which no class of society is immune, exaggeration of its menace is a very forgivable error.

Two years ago I published certain deductions as to the prevalence and depredations of the congenital form of the disease, which were based on my personal experience whilst in charge of a venereal disease clinic, on the study of vital statistics, and on a study of the literature. These deductions may be briefly summarized as follows:

(1) In 1920, in Toronto, there were approximately 2,000 still-births and miscarriages, and of these one-third or 670 were (judging by statistics given by numerous authors) syphilitic in aetiology. This meant an unnecessary loss to that city of 670 live births—unnecessary since we know that a large proportion of these pre-natal deaths could have been prevented had the parents received proper treatment.

(2) Four per cent. of admissions to the wards of the Hospital for Sick Children, Toronto, were proven to be syphilitic. Probably 5 per cent. of all live births are infected and of these 25 per cent. die in the first year. Thus in Toronto, alone, approximately 160 infants die annually as a result of a syphilitic infection. Compare this figure with the number of deaths due to broncho and lobar pneumonia, 176, and to digestive disturbances, 224, and the importance and the seriousness of the problem is realized .

The question is frequently asked—What percentage of the child population of a community can be deemed to be luetic? Although 4 per cent. of hospital medical admissions are found to be Wassermann positive, this figure cannot be made applicable to the community as a whole, since such hospital admissions are drawn largely from the poorer classes, and it is probable, though not proven, that in this class there is a greater incidence of syphilis. Jeans and Cooke, by a study of a large number of cases drawn from various classes of society, estimated that in St. Louis the incidence of hereditary syphilis at birth is only 3 per cent. Williams of Baltimore believes, however, that 6.5 per cent. are infected. It is probable that the smaller figure is more nearly correct. There is no doubt that the birth incidence of lues has been, and still is, much affected by the Great War. The number of cases encountered where the infection has been traced to the father who has contracted the disease overseas is very striking, and it will be some years yet before this influence is mitigated.

The ante-natal and post-natal mortality due to hereditary syphilis, though the most serious aspect of the problem, is by no means the only aspect. One has but to attend a venereal disease clinic at a children's hospital and see thirty or forty of these patients coming in for treatment to realize some of the late effects that may be produced. Of 138 tertiary cases in my own clinic, 3 per cent. are deaf; 3 per cent. have incurable deformities of the palate or nose; 8 per cent. have permanent impairment of sight, and 12.3 per cent. are mentally deficient. Thus over one-quarter of these children have incurable physical defects which will in later life markedly diminish their earning capacity and will in some cases render them charges on the municipality.

Realization by the profession of the seriousness of the problem which confronts us is the first stepping stone to the more difficult task of its correction. It is doubtful if such correction can ever be complete, but there can be no question that great improvement can and will be accomplished. The principal methods employed are four in number: (1) Education of the public; (2) Education of students and practitioners of medicine to a fuller knowledge of the symptomatology and treatment of the disease; (3) Efficient pre-natal treatment; (4) Intelligent treatment of the syphilitic child or adult.

The first method, *e.g.* education of the public, it is not my intention to discuss in this paper, except to state my personal conviction that educational propaganda directed toward the adolescent child may, unless the greatest care is exercised, do more harm than good.

As to the second method—the education of the profession—improvement is taking place each year, but I feel that, in so far as the teaching of hereditary syphilis is concerned there is still room for progress. The number of cases in the early or late stage in which an incorrect diagnosis has been made by the physician referring the case to the hospital is very striking. If every one of us were on the watch for only the more common manifestations of the early and late stage of hereditary syphilis, I am convinced that 95 per cent. of all cases would be detected. In the early stage the eruption is typical and should never be mistaken for any other disease. Its time of appearance—usually in the first month of life; its characteristic distribution, involving as it does the middle zone of the face and the palms and soles, and leaving the abdomen and lower part of the back comparatively clear should render the diagnosis easy. If, associated with this eruption is an enlarged spleen and a persistent rhinitis, treatment should be instituted immediately. The importance of examining every infant when first seen, for possible splenic enlargement, cannot be too strongly emphasized. There are not many conditions in infancy which produce such an enlargement: on the other hand, it is a sign which is present in about 85 per cent. of all luetic infants. One other manifestation of the disease should be mentioned here since it is not infrequently unrecognized—the pseudoparalysis of one or both upper extremities due to a specific epiphysitis or periostitis. It was the appearance of this symptom which prompted the parents of over 20 per cent. of my cases to seek medical advice.

In the late stage the development of interstitial keratitis, periostitis of the long bones, progressive mental deficiency or paralysis, and the presence of Hutchinson's teeth are the reasons for the large majority of patients applying for treatment. The lantern slides which I will show at the end of the paper will portray some of these conditions better than I can describe them.

No discussion of the treatment of congenital syphilis is complete without reference to the ante-natal treatment. The literature at present is full of reports by many observers dealing with this phase of the subject, and their results of treatment differ only in respect to the degree of success achieved. I have yet to see results recorded which were discouraging. It is the consensus of opinion that the pregnant, syphilitic woman is unusually amenable to antiluetic treatment, and that with anything like efficient therapy, we may expect healthy births in about 93 per cent. of the cases. Thus the prenatal and infant mortality due to syphilis in the city of Toronto could, with efficient treatment of the pregnant mother, be reduced from 830 to 58, or a saving annually of 772 infant lives.

Lastly, let us consider briefly the treatment of the syphilitic child and the results that may reasonably be expected to follow such treatment. An analysis of the cases under my care up to May, 1922, showed that with persistent arsenical and mercurial therapy a negative Wassermann reaction and an apparent cure could be obtained in a large percentage of the early cases, in a smaller percentage of the latent cases, and in a very materially smaller percentage of the tertiary cases. The average time required to produce a persistently negative Wassermann varied according to the stage of the disease when treatment was commenced. In the early stage an average of six months was required: in the latent stage eleven months, and in the tertiary stage sixteen and a half months. Thus to obtain an accurate conception of our ability to cure the disease it is obvious that we must consider only those cases in the first, second and third stages which have been under treatment for six, eleven and sixteen and a half months respectively.

In estimating the results of treatment, I have used the Wassermann reaction as an index, not that I think it is an ideal or infallible index, but it is unfortunately the only one we have at the present time. An apparently cured case in these statistics is one which has had three or more successive negative Wassermann tests taken at two or three months interval, and in which, needless to say, there are no signs of active syphilitic infection. Improved cases are those in which the Wassermann reaction is fluctuating between a negative and a weakly positive. Unimproved cases are those whose blood test is still positive or strongly positive.

Of thirty cases in the early stage, 83.3 per cent. are cured, 3.3 per cent. improved, and 13.3 per cent. unimproved.

Of fourteen cases in the latent stage, 35.7 per cent. are cured, 28.6 per cent. improved and 35.7 per cent. unimproved.

Of sixty-six tertiary cases, only 24.2 per cent. are cured, 24.2 per cent. improved, and 51.6 per cent unimproved.

The results appear, at first glance, to be a little discouraging, particularly the results obtained in the tertiary stage, but it must be remembered that this condition is the most intractable to treatment of all syphilitic conditions. In this group of cases, moreover, are many who attended very irregularly for treatment, and these cases helped materially to lower the percentage of cures.

I have purposely omitted detailing the exact routine of treatment as this has been published previously, but there are several important points in the management of these cases which I feel should be emphasized:

(1) In dealing with the new-born luetic infant, one must use discretion in the administration of salvarsan intravenously. If the child is markedly undernourished and anaemic, it is, as a rule, better policy to restrict one's treatment to the use of mercurial inunctions until such time as the general condition of the patient improves.

(2) Attention to the diet and maintenance of the nutrition of the young infant is quite as important as anti-luetic medication. Needless to say, every effort should be made to maintain maternal nursing.

(3) Treatment of the nursing infant through the medium of the mother's milk has nothing to recommend it except ease of administration. Such treatment is both inadequate and ineffective.

(4) Persistency and regularity of treatment is one of the prime essentials to success.

(5) The greatest problem to be faced is the management of the Wassermann-fast case—the child who reports for treatment usually with some tertiary manifestation and whose blood after two or three years' conscientious treatment is persistently very strongly positive. Such cases are, as a rule, symptom-free, and the problem which demands solution is—shall we continue intravenous therapy at the risk of producing arsenical poisoning, or shall we discontinue treatment and invite a return of symptoms such as those of cerebro-spinal syphilis?

After four years' observation of such cases, I am becoming more and more convinced that the continuation of arsenical treatment for longer than two years is seldom if ever, advisable. The possibility of the disease causing serious trouble in later life is, I believe, greatly exaggerated, and my own experience is that the best plan of procedure consists in improving the child's general condition by intelligent dietetic, hygienic and tonic treatment, and in ignoring altogether the Wassermann reaction.

Stage	*Cases*	*Cured*	*Improved*	*Unimproved*
Early	30	83.3%	3.3%	13.3%
Latent	14	35.7%	28.6%	35.7%
Late	66	24.2%	24.2%	51.6%
Total	110	41.8%	19.1%	39.1%

THE CLINICAL VALUE OF D'ESPINE'S SIGN*

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SOME years ago D'Espine called attention to the fact that a whispered sound following the spoken voice in some patients may be heard over the spinous processes of the upper thoracic vertebrae; and that such a sound was abnormal.[1] .He considered this to be the earliest physical sign of enlargement of the tracheo-bronchial lymph nodes. We find in our literature, however, that different interpretations of this sign have been made by various authors. Dr. Morse of Boston, in a recent article, states that he had the interpretation of this sign confirmed by D'Espine in August, 1921.[2]

It may be well to state at the outset that opinions differ as to the value of this sign. The Committee on Medical Research of the National Tuberculosis Association has concluded, as a result of a study of the x-ray and clinical findings in chests of normal children from six to ten years of age that D'Espine's sign, as indicative of enlarged tracheo-bronchial lymph nodes, is of little value.[3]

On the other hand, there are many who attach great importance to its presence.

In view of the fact that manifest adult tuberculosis is looked upon as secondary to tuberculosis of the bronchial glands—that is to say, an endogenous mode of infection taking place in adult life as a result of intercurrent disease, or unfavourable environment and lowered resistance—I determined to pay particular attention to the study of all children coming to the chest clinics at the health centres, whether they were well or sick. Autopsy records of tuberculous children show us that the bronchial glands are involved in from 80% to 100% of the cases, and in 60% of the tuberculous adults. We should therefore endeavor to demonstrate them clinically in all children suspected of the disease.

At our various clinics, 395 complete physical examinations of the chests were made on children up to sixteen years of age. These were consecutive examinations carried out within a certain period of time. Of that number, 238 such examinations were made at one clinic and these will be offered for further analysis.

D'Espine's sign is best elicited when the arms are folded well across the chest, the head sharply flexed, and the patient sitting erect. The examiner auscultates posteriorly over the course of the trachea, and the patient is asked to speak sharply, using the words ''one'' or "nine.'' In positive cases, the voice is found to be accompanied by an added whispering sound localized to one or two vertebrae, often extending to the fourth and fifth dorsal spines, and occasionally to the sixth.

It might be well at this point, to bring out a factor which probably enters into the formation of D'Espine's sign: I refer to the level of the tracheal bifurcation. In the infant, it is at the level of the seventh cervical spine, and by the tenth year, it has reached the third, while in the adult it is at the fourth or fifth. Consequently in our study of this sign, we expect it to be heard below the tracheal bifurcation. In positive cases the glandular mass acts like consolidated lung tissue, in that it becomes a good voice conductor.

D'Espine's sign was present in 45 cases examined. The diagnoses in these cases were: whooping cough in three cases; chronic bronchitis in three cases; acute bronchitis in four cases; tuberculosis of the bronchial glands in fourteen cases: pulmonary tuberculosis in two cases; and the remainder (nineteen) were suffering from undernourishment, diseased tonsils, adenoids, etc.

The diagnosis of the fourteen cases of tuberculosis of the tracheo-bronchial glands was based chiefly on the clinical manifestations.

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The symptoms in these cases consisted of certain pressure symptoms, and the toxic symptoms so characteristic of a chronic tuberculous process. Lack of evident cause for change in the general condition of a child is, I think, characteristic of a tuberculous lesion in the bronchial glands. These cases then, were considered as being clinically active.

Another group of 43 children were suffering from some form of respiratory disease, but D'Espine's sign was not present. The diagnoses in these cases were: whooping cough in five cases; bronchial asthma in two cases; asthmatic bronchitis in two cases; bronchiectasis in three cases; unresolved pneumonia in two cases; chronic pharyngitis in one case; chronic bronchitis in 20 cases; pulmonary tuberculosis in three cases; tuberculous pleurisy in two cases; tuberculosis of the bronchial glands in two cases; and pulmonary abscess in one case. (Incidentally, I may mention a case of Hodgkin's disease which belongs to another clinic and in which this sign was absent.)

Still another group of children, in whom a definite cervical adenitis was diagnosed, had D'Espine's sign present. In the absence of x-ray examination, the question arises whether or no there was an associated tracheo-bronchial adenopathy.

It was interesting to note that, in four cases diagnosed as having tuberculosis of the bronchial glands, D'Espine's sign had almost disappeared on final examination after a prolonged period of observation. It is possible, of course, that we may have been dealing with a non-tuberculous process. We speak of the glandular enlargement following measles and whooping cough as being evanescent, that is to say, these glands may return to normal sooner or later after the acute infectious process has cleared up. This was noted in two children suffering from whooping cough.

In our study of D'Espine's sign, observations were also carried out in respect to venous arborization, spinal and interscapular dullness, and the bronchial sound of the spoken and whispered voice and of respiration. Eustace Smith's sign was also checked up.

Occasionally, dilated capillaries were seen between the seventh cervical spine and the third dorsal spine in respiratory cases with and without D'Espine's sign, as well as in cases whose chests showed no evidence of pulmonary disease.

Bronchial breathing when listened to over the cervical spines is very distinct from the occiput to the seventh cervical spine; then it becomes quite distant until the level of the bifurcation of the trachea is reached, when it becomes vesicular in quality. As a rule it was noted that the bronchial breathing extended to almost the same level as D'Espine's sign, and occasionally it was found to extend beyond it. It should be stated here that an exaggerated vesiculo-bronchial respiratory murmur. often heard posteriorly between the second and fourth dorsal spines, and particularly to the right of the spine, is a normal finding in children. This is related to the right primary bronchus.

The bronchial whisper, obtained by auscultating over the cervical spines while the patient is whispering "one-two-three" or "three-thirty-three," is subject to the same variations or modifications as the bronchial breath sound just discussed. That is to say, the whispered sound would lose its distant bronchial character and become vesicular, or disappear altogether after the bifurcation of the trachea was passed. It certainly was noted that in most cases where a D'Espine's sign was found, the bronchial whisper would extend to the same level.

The bronchial voice sound, on the other hand, seemed to become vesicular in quality soon after the seventh cervical spine was passed in the majority of cases.

In adults, a dull note is normally present over the first four dorsal spines, and in children there is normally a dull note extending to the second or third dorsal spine. A dullness over the fourth, fifth or sixth spine would have to be considered as pathological.

In those cases with a definite D'Espine's sign, I did not find the vertebral dullness extending below the third dorsal spine in any case. There was only one case that demonstrated interscapular dullness, and that always signifies that considerable pathological change is present.

Eustace Smith's sign, or the venous hum heard over the upper sternum, bears no relation to D'Espine's sign. It is heard as frequently in apparently normal children as it is in those with respiratory disease.

In the three groups, most of the children were tested with tuberculin both with the human as well as the bovine types of tuberculin (Pirquet). Approximately fifty per cent reacted to one or both types of tuberculin in each group.

X-ray confirmation of bronchial gland tuberculosis has only been carried out in selected cases. I can only state the observations of the x-ray groups of the Research Committee referred to earlier in the paper. It was the consensus of opinion that children are probably more apt to show definite x-ray evidences (of simple as well as serious respiratory affections) in the hilum and trunk shadows than are adults. In the Committee's series, twenty-three children presented a D'Espine's sign without any corroborative evidence on x-ray examination. In three others, there was x-ray evidence of tracheo-bronchial adenopathy, but the sign could not be elicited.[4]

In the absence of postmortem work on this subject, we have not the opportunity of conclusively checking up the physical and x-ray signs that we often may attribute to adenopathy.

SUMMARY

There are signs to be studied over the vertebrae which may have to be considered normal or abnormal; and D'Espine's sign is the most important of these.

This sign has been found associated with bronchial glandular tuberculosis, with non-tuberculous respiratory affections, and in apparently normal children. It has also been found absent in cases of bronchial glandular tuberculosis and the non-tuberculous respiratory affections. It was associated with fourteen cases of bronchial glandular tuberculosis and two cases of pulmonary tuberculosis. It was absent in three cases of pulmonary tuberculosis, two cases of tuberculous pleurisy and two cases of bronchial glandular tuberculosis. The frequency of this sign then, can be noted in this group of cases.

In many cases, no satisfactory explanation could be offered to account for its presence, nor can I explain why it should be absent in those cases where one would expect to find it.

When compared with the extension of the bronchial sound of the spoken and whispered voice, and of the respiration, as well as the spinal dullness, it was found to be the most constant of these physical signs.

Tuberculosis of the bronchial glands often exists as a distinct clinical entity, and should be capable of diagnosis, as the recognition of such a condition while limited to the bronchial glands, is of the utmost importance.

Corroborative evidence by means of the x-ray should be obtained whenever D'Espine's or the allied signs suggest a tracheo-bronchial adenopathy.

D'Espine's sign, then, should be of some clinical value in the diagnosis of disease of the bronchial glands, only when properly evaluated and correlated with clinical, laboratory and roentgenographic data.

REFERENCES

(1) D'ESPINE, *Bulletin de l'Acad. de Med.* Paris, 1907, vol. 57: 167. (2) MORSE, M. L., *Am. J. Dis. Child.* vol. 24, No. 5, p. 362. (3) Transactions of National Tuberculosis Association, 1922, p. 529. (4) Ibid.

Improved Technique for Topographic Percussion.—Oettinger refers particularly to deep percussion of the heart, and mentions several advantages from the method of tapping the distal epiphysis of the middle phalanx, the finger bent at the joint between the middle and the terminal phalanx. The finger is applied with some force but is lifted up immediately as it is lightly tapped.

Action of Light on Blood Regeneration.—Hobert bled mice and observed the regeneration of the blood under different conditions. It was very slow, if the animals were kept in darkness. They lost appetite and died. When kept in daylight, the regeneration was complete in thirteen or fourteen days after a bleeding with loss of 50 per cent. of the erythrocytes. The ultraviolet rays, applied best in four or five day intervals, conditioned a regeneration in ten or eleven days.—*Klinische Wochenschrift*, June, 21, 1923.

FEEDING PROBLEMS OF OLDER CHILDREN*

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PEDIATRISTS are credited with the ability to care for the feeding problems of infants during their first year of life and to meet all types of eventualities and intricacies arising during this period. Adjusting the peculiarities of digestion, treating intolerance for one or other element making up the total food of the infant, supplying its requirements in total calories as well as in the proportions of the different elements of its food are acknowledged as the special sphere of the pediatrist in so far as infant feeding is concerned. It is a rare occurrence nowadays, with the popularization of the pediatric idea and with the development of health centres and pediatric clinics, to find an artificially fed infant who is not under the care of some physician who is endeavouring to properly supply that child's requirements after one or other of the accepted methods of feeding.

This worthy zeal with which the problems concerning the feeding of infants during their first year of life are followed seems often to lag after the first year has passed. Once the infant is given whole milk with a goodly allowance of solid or semi-solid food and there is no longer the necessity for careful adjustments of formulae, the mother is all too frequently left to herself, while interest in the case as a feeding problem wanes. That there are feeding problems in children past the first year of life, and especially during what is called the pre-school age, cannot be denied. Anyone who is called upon to handle a large number of children will testify that often these problems tax the ingenuity of the physician. It is the nature and method of handling some of these problems that I wish to discuss in this paper.

The older child is most frequently brought to the physician with the complaint that he has no appetite. In looking through a large number of private case histories this is the complaint which occurs most frequently in the writer's experience. With the infant it is different. Poor appetite in the infant rarely plays an important rôle; here the frequent complaints are failure to gain regularly, vomiting, irregularities of the bowels, etc., but with the older and sometimes apparently healthy child, it is the unwillingness of the child to eat that which is placed before him which constitutes the outstanding feature of his feeding problem from the mother's standpoint. Likewise from the standpoint of the physician, whatever the cause of the nutritional disorder may be found to be, this lack of desire for food is the complaint most common to all the causes.

The causes of poor appetite may be discussed under the following headings:

1.—Children with physical defects.

2.—Children with faulty digestion, especially with greater or less intolerance to fat or carbohydrate.

3.—Faulty diets.

4.—Children whose diets are not faulty, but who lack proper discipline.

Combinations of any of the above, may of course frequently be found.

1.—*Children with Physical Defects.*—Any physical defect which is allowed to go untreated in a child is liable to affect its nutrition. The effect of constitutional diseases is of course obvious; no one will deny the effect of, say, Potts' disease, or valvular heart disease, or nephritis on the child's nutritional condition. In these instances, however, the child will more often be brought to the physician with complaints referable to the location of the trouble. No less important to the nutritional state, however, are such conditions as carious teeth, enlarged cervical glands, diseased tonsils, hypertrophied adenoids, and faulty posture. Whenever one or other of these defects exists, attempts must be made toward their correction. It is a grave error to counsel a mother to do nothing to carious deciduous teeth, and much worse for the physician or the dentist to advise their premature extraction. Carious teeth require careful attention. There is now arising both in the United States and Canada a group of dentists who specialize in the care of children's teeth. These men are known as "pediadontists" and bear the same relationship to general dentistry that the pediatrist does to general medicine. Like the pediatrists, their work is chiefly prophylactic. They devote themselves to the work of preserving the deciduous teeth by cleaning them carefully and by inserting temporarily cement fillings in the cavities. They will rarely and only for extremely good reasons advise the extraction of a temporary tooth. Physicians will find it greatly to the advantage of the patient to obtain from one of these men an opinion on what is best to be done in those instances of carious teeth.

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*Read at the Section of Diseases of Children, Ontario Medical Association, Windsor, June, 1923.

Hypertrophied cervical glands are usually due to absorption from teeth or tonsils, and attention to the contributing cause whatever it may be, will usually remedy this defect. It is after the cause has been removed that the syrup of the iodide of iron is most effective, not before.

The tonsils are often responsible for lack of appetite in children; not when they are large merely, but when they are manifestly diseased. It is not the purpose of this paper to enter into a detailed discussion on tonsillectomy. Suffice it to say, however, that from the standpoint of the subject under discussion, the hypertrophied or imbedded tonsils with resultant enlargement of the cervical glands, especially where there is a history of frequent colds, are best removed. As for the adenoids, manifestations of their enlargement are sufficiently evident to all physicians. Removal is indicated when their size is sufficient to produce nasopharyngeal obstruction with all its attendant symptoms.

Faulty posture, flat feet, scoliosis, etc. are themselves sufficiently obvious upon a careful routine physical examination. Talbot[1] has demonstrated the association of faulty bodily mechanics with diminished powers of digesting fat, with chronic constipation and with some cases of periodic vomiting. He has shown how by simple exercises and by the use of abdominal supports, these defects can be corrected and the accompanying symptoms cured.

The great error so often made is that the child who is brought to the physician simply with the complaint of having a poor appetite, is all too often dismissed with a cursory examination of the heart, and a tonic containing tincture of nux vomica to be given before meals. It cannot be too strongly emphasized that a careful and complete physical examination with the child completely undressed, as well as records of the height and weight of the child, are of the very greatest importance in the diagnosis of these cases.

2.—*Children with Faulty Digestion.* When we come to consider children with faulty digestion we find that they fall into two main groups. We have one group in which there is a prolonged intolerance of carbohydrates and another in which there is a varying inability to digest fats. The cases of carbohydrate intolerance often date back to infancy and generally belong to the class known as chronic intestinal indigestion. These cases, perhaps, present some of the most difficult feeding problems that we are called upon to consider. The children of this group are very much undersized and underweight, have very prominent abdomens, pass large, porridgy and foul stools, and show a very great intolerance of carbohydrates with a varying intolerance of fats, depending upon the severity of the case. This group is so important that it falls into a class by itself. The cases require the most painstaking and careful study in the regulation of the diet, often lasting over a period of years before any satisfactory results can be seen. It is scarcely in the scope of this paper to enter into a discussion on the pathogenesis and treatment of chronic intestinal indigestion; suffice it to say that the best results are obtained by diets rich in proteins and poor in carbohydrates and fats. Details of such diets as well as metabolic studies may be found in a recent paper on the subject by Dr. Alan Brown and his associates.[2]

Faulty digestion of fat is a more common condition and considerably simpler in treatment. Poor appetite, coated tongue, heavy breath, constipation, sometimes light coloured, grey stools which are very foul, are among the outstanding symptoms. These children are often underweight, have sallow complexions and are particularly listless. A microscopic examination of the stool stained with Sudan III. almost invariably shows quantities of undigested fats varying in amount according to the severity of the case. The treatment of this group in addition to regulation of the diet, is first, to remove all the fat from the dietary, prohibiting cream and butter entirely and completely skimming the milk. A change in the disposition of the child will be noted almost immediately after treatment has been begun. The sallow colour soon gives way to a clear skin of good colour, the child becomes playful and shows satisfactory gains in weight almost from the beginning of treatment. As improvement continues it is permissible, as well as desirable, to allow small quantities of butter, watching the effect upon the stool. The reason for the introduction of butter is in order not to deprive the child for too long a period of the fat soluble vitamin contained in butter. However, if butter is not well tolerated it is possible to supply the deficiency of the vitamin by giving small quantities of cod liver oil. This, in my experience, is often very well handled by these patients; say five or ten drops three times daily. If given early in the treatment, there is no reason to fear the development of symptoms which may follow a prolonged deprivation of the fat soluble vitamin. Cream should never be allowed, and a return to whole milk from the skimmed milk, after definite signs of improvement have been manifest will hardly be found necessary, although it cannot be said that such a change would invariably prove harmful.

3.—*Faulty Diets.* We come now to a consideration of the largest of these groups, namely, those children who show no physical defects, who may or may not be undernourished, but who have poor appetites chiefly because their diets are faulty. It is in such cases where the physician is tempted to dismiss his patient with a tonic.

The importance of taking a careful and detailed history of all the child's habits as well as of his daily menu cannot be too strongly emphasized. It will not suffice to ask how many meals the child eats each day, for the mother will invariably answer "three." She does not consider that a drink of milk an hour before breakfast is food, and she has the same attitude toward the mid-morning drink of milk, the mid-afternoon drink of milk and the late night drink of milk. These, to the mother, merely mean giving the child a drink, and it is difficult to convince her that these drinks may interfere with the regular meals of the child. To cite a case in point: a child of three years, in good physical condition, though somewhat pale, was brought to me because of poor appetite. Questioned as to how many meals the child was given per day, the mother definitely answered that she gave the child three meals with nothing to eat in between. Detailed questioning however, revealed the following interesting information, that in addition to eight ounces of milk at each meal, the child took a drink of eight ounces of milk upon awakening, another at 10 a.m. before the morning nap, another at 4 p.m. after the afternoon sleep, and another at 10 p.m., when she would invariably awake and demand her bottle. The child was actually consuming a total of fifty-six ounces of milk per day containing over eleven hundred calories. The weight of the child was thirty pounds. Allowing 40 calories to the pound as covering the needs of a child of this age, the total daily requirements amounted only to 1,200 calories, 1,100 of which were being supplied to the child in the form of milk alone. Little wonder that this child had no appetite! Treatment in this instance consisted merely of reducing the daily milk allowance to twenty ounces, allowing eight ounces with the breakfast and a similar quantity with the evening meal. The remaining four ounces were to be used in custards and milk puddings. With these simple changes the appetite immediately improved and the pallor was shortly replaced by a good, healthy complexion.

Many mothers include cream in the dietary of the child with or without the advice of the attending physician. While some children can tolerate this addition perfectly well, many cannot. The effect upon the appetite becomes noticeable almost immediately. It is my firm belief that cream has no place whatever in the dietary of a young child, first because it is all too frequently not well borne, giving rise to symptoms of fat intolerance, and secondly, because it is far more effective than an excess of milk in destroying the appetite. Often a mother will deny having ever given her child any cream, when detailed questioning will reveal the fact that she does give him "the top of the bottle."

It is so common an experience to find physicians and child health organizations, as well as people interested in the sale of milk, recommending that children be encouraged to drink as much milk as possible during the day; at meals, between meals and at bedtime. The slogan "as much milk as the child can drink" has been popularized throughout the length and breadth of the United States and Canada, with the result that milk is often given to the exclusion of green vegetables, red meat and coarse bread.

Only a few days ago I saw a child twenty months of age, of good family, who was brought not so much because the appetite was poor, but because of a progressive pallor which had become quite noticeable about six months previously. The haemoglobin was down to 35% and the erythrocytes were 2,550,000. This child was consuming a quart of milk a day (40 ounces), a little cream on her morning cereal, and practically no other food. When it was explained to the mother that the fault lay in the fact that the diet had consisted too exclusively of milk she was greatly surprised and remarked "I have always been told to give the child as much milk as possible."

This brings us to the question of the optimum daily quantity of milk in the dietary of a child who is on solid food—that is, any time after the first year. Without wishing to enter into a polemic on this subject, and without assuming an iconoclastic attitude towards a time-honoured practice, one might still with reason ask this question: is milk, as a liquid food, an indispensable part of the dietary of a child who has teeth and is able to use them? The answer is unquestionably in the negative. A balanced daily allowance of digestible food, sufficient to meet the needs of the growing child, sufficient in total calories, sufficient in each of the essential food elements, namely fat, carbohydrate, protein, salts and water, and sufficient in all the vitamines is what is indispensable. While fresh milk meets the needs in the infant, it falls short of the needs of the older child. The older child has teeth and must be made to use them. Therefore I would say, whatever be the quantity of milk allowed to a child, it must never be such as to inhibit the appetite for the more substantial solid foods. Milk must never be given between the regular meals, nor is it desirable to allow milk at all the meals. Between twenty-four and thirty ounces daily is more than ample for a child between one and two years of age, while after two years it is scarcely necessary and often undesirable to allow more than from sixteen to twenty ounces daily. One of my patients, a child of four, who suffered from an intolerance to cows' milk in any quantity, has not received one drop of milk in any form for more than two years. His growth and development have been quite normal and he has had no ill effects from this prolonged omission of milk from his diet.

The development at an early age of a liking for foods other than milk is of extreme importance as a distinct prophylactic against nutritional disturbances of later childhood. Healthy infants who are given cereal and rusks at about six months of age, invariably take these foods well and digest them perfectly, but if close to a year is allowed to elapse before foods other than milk are allowed, it is not an uncommon experience to have the child obstinately refuse anything but his bottle. Early training in drinking from a cup or from a spoon is no less valuable. It is not desirable to allow the child to form a fixed habit of taking his food in one way only—such as sucking it from a nipple—and the longer this habit exists, the more difficult it becomes to break away from it.

The problem of lack of appetite due to faulty diets, then, will most frequently be found to arise from an excess of milk or cream, or both, given with meals and between meals. Needless to say, sweets or food of any kind, sometimes even fruit, given between meals may have the same effect. A child will eat what is put before him if he is hungry, but not otherwise. And here it is well to point out the value of skimming the milk as a means of stimulating the appetite. It is perhaps one of the best means at our disposal and it cannot be too highly recommended.

4.—*Faulty Discipline.* We are frequently confronted with the problem of the child whose diet has not been particularly faulty, who is given nothing to eat between meals, and yet, who has no appetite and does not gain in weight. The physical examination rarely reveals anything which bears directly upon the cause of his poor appetite, but a careful survey of the child's habits will often prove enlightening. The question of discipline at meal times is equal in importance to that of the regulation of the diet. Poor discipline will at times be found to be the sole cause of the subnutrition. We must ask the parent the following questions: Does the child eat alone, or does he eat at the table with the rest of the family? Does he have toys to play with while he is eating? Does he feed himself, or does he refuse to eat unless he is fed? Does the mother coax the child to eat, or give him larger portions of food of which he is especially fond to replace that which he has refused to eat? How long is he allowed to spend at each meal? How long is the interval between meals? How long does the child rest during the day? How late is he allowed to stay up, and at what time does he awaken in the morning?

Children should eat by themselves, and from the earliest possible age be taught to feed themselves. Toys or diversions of any kind must not be allowed at meal time. No child should ever be urged or forced to eat that which he refuses; he must be allowed to go hungry until the next meal time. Allowing the child to sit for two hours at table, alternately eating a bit, playing with toys, running off and having to be brought back or coaxed back in order to finish what was left are among the worst habits possible. Still worse is it from the standpoint of discipline to answer a call for food between meals after a child has refused to eat what was set before him at meal time. The child must be made to wait. A mother will often complain that the child will not eat unless she sits beside him; another, that she must feed him; another, that he must have a certain toy before he is willing to take food. The truth is that any child will eat if he is hungry, but not otherwise.

In order to stimulate the appetite, then, all these errors of discipline must be corrected. The entire meal should be placed before the child, and he should be left alone without toys, from twenty-five to thirty minutes. Whatever is left uneaten at the end of that time, whether it be much or little, must be removed and no morsel of food, nothing but water, is to be given until the next meal. The interval between meals should in no instance be less than five hours, and sometimes five and a half hours. It is often surprising how quickly a child will commence to eat and to gain in weight when these simple rules are rigidly enforced. To cite another case, a child of seven was brought for lack of appetite. The diet was not faulty, the milk not excessive, nothing was given between meals, tonics had been used without effect. The history revealed that the child was allowed to spend two hours and sometimes longer at each meal, playing with his food. The child was put in a room by himself with his entire meal before him, and left there for twenty minutes. at the end of this time the mother was instructed to remove the tray and to give no food whatever for five and a half hours. No explanation was given to the child of what was going to happen. At the first meal, the child paid no attention to the food, and scarcely protested against its being removed at the end of twenty minutes, but at the next meal time he was ready to eat. His appetite has been good ever since, and he has gained weight steadily.

There remains for me to say a word about the place and value of tonics as aids in solving some of these problems of feeding in older children. It will follow from what has been said that before tonics are considered, it is necessary to go carefully into the entire history of the child's habits and mode of life generally as well as to make a careful and complete physical examination. When defects have been discovered and corrected, when faults in the diet and in the discipline have been given due attention, then, and not until then, may this question of tonics be considered as an aid to the various lines of treatment outlined above. Iron tonics such as the wine of the citrate of iron are useful where anaemia is a feature of the condition, while in other instances a minim or two of the tincture of nux vomica in a suitable mixture given a short time before each meal, is very useful.

Such then, is a very sketchy outline indeed, of some of the problems with which we are confronted in dealing with the feeding of children past the age of infancy. The points to be especially emphasized are, that a complete physical examination is essential in every case, with an examination of the stool in some; that all discoverable defects or chronic infections be given the necessary attention; that the diet be carefully regulated with regard to the amount and kind of food, the intervals between meals and the discipline, and that tonics are of value only as adjuncts to the methods of treatment outlined.

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SUGGESTION, ANCIENT AND MODERN*

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HAVING been invited to open the discussion this evening on Couéism, and suggestion in general, I have elected to begin at the beginning, with a brief review of the development of suggestion and susceptibility to suggestion.

No intelligent discussion of the treatment of disease by suggestion is possible without introducing the question of the production of disease by suggestion. Professor Charcot, whose authority on matters pertaining to hypnotism and suggestion is widely recognized, arrived at the conclusion that the hypnotic state was, in fact, a state of induced hysteria. His observations led him to believe that symptoms which could be relieved by suggestion might also be produced by suggestion. Furthermore, the healing art has, from the early ages, been so closely associated with mysticism, superstition, and religion that one is almost forced to make frequent references to the Scriptures, which will be quoted as purely historical records. If I were asked to designate a text for my sermon I should quote from a recent issue of *The New York Tribune*, as follows:—"To-day we have a new god. It is called the subconscious mind, and it is worshipped without being understood." Perhaps it is not a new god, only an old god wearing a new mantle.

So far as I know, there is no record of this so-called new method of treatment, by suggestion, having been employed for the relief of, or prevention of suffering prior to the year 600,000 B.C.. In *An Outline of History* by H. G. Wells, under the caption, "Tradition Comes into the World," one reads as follows:—"All the mammals excepting the two genera we have named, had already before the lower Eocene age arrived at this stage of pre-adult dependence and imitation. They were all more or less imitative in youth and capable of a certain modicum of education; they all, as a part of their development, received a certain amount of care and example and even direction from their mother." No doubt, the parent suggested to the offspring, by gesture and example, how the pangs of cold and hunger might be alleviated or prevented. Suggestion stimulated to action, and repeated action resulted in habit. With the development of reason, the offspring began to suggest to himself as well as to his fellows. Thus suggestion and auto-suggestion, action and reaction have gone on developing and expanding through six hundred thousand years. Is it any wonder that the power of suggestion and the subconscious mind have attained the magnitude of a god, to be worshipped without being understood by the intellect of a single generation? Even allowing for a development of the human intellect, the genus man dates backwards to only some two hundred and fifty thousand years. Necessity is said to be the mother of invention. Demand is probably the father of supply, physiologically and psychologically, as well as economically.

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About seven thousand years ago, men were living in groups, banded together, no doubt, partly for protection, and partly because man is, by nature, a social animal. This tribal life, the male dominating his immediate family, the female caring for her offspring, and the whole tribe dominated, no doubt, by the strongest male, laid the foundation for the complexes ascribed by Freud to the emotions of "father fear" and "mother love." Each tribe would, in time, reflect the personality of its chief, for as Emerson wrote, "Every great institution is but the lengthened shadow of a single man." Thus was tradition developed, which engenders fetishism, mysticism, and superstition. Superstition in turn paves the way for religion. To again quote H. G. Wells, "the history of man is a race between knowledge and catastrophe." The same might be said of the history of the treatment of the ills that man is heir to. The idea of supernatural power, vested in one or more gods, was gradually evolved. This idea, no doubt, stimulated the more thoughtful of men to observe and study the phenomena of nature. These men became known as priests and were in possession of the scientific knowledge of the times, including matters of health and well-being. Consequently, in early recorded history we find the art and science of healing, intimately associated with religion. Joseph, we are told, was a dreamer and an interpreter of dreams. No doubt, he was a practical psychologist and dealt occasionally with cases of anxiety neuroses. It is even possible that he may have given corrective advice to those who consulted him, and assured them that they might, day by day, become better and better.

In the early ages of civilization, religion, with all its components, including the art of healing, was taken seriously. Sound doctrines and laws, governing the welfare of body and soul, were promulgated by Moses, Gautama Buddha, Confucius, Jesus of Nazareth, and many others. In the chronicles of the life of Jesus Christ, it is frequently stated that He healed all sick who were brought before Him; nevertheless, it is interesting to note that, in most instances where mention is made of specific cases, those cases are of a psychopathic or neurotic nature. Frequent reference is made to the casting out of devils. The functional nature of the case is indicated by a statement that the woman was possessed of a devil. It was sometimes a question of diagnosis, as in the case reported in the ninth chapter of the gospel according to St. Matthew, where Jesus said, "The maid is not dead, but sleeping," then he took her hand and she arose. Again there is the case of the leper who was healed, as Jesus descended after the sermon on the mount. You are all aware that there are different forms of leprosy and different stages in the pathological development of the disease. You are also aware that there are neurotics and hypochondriacs. In the light of our present knowledge, most of the cases of miraculous healing will bear scrutiny without detracting from their right to commemoration. Faith was the key-note of healing as practiced by Jesus Christ and His disciples. The restoration of sight to two blind men described by St. Matthew is a fair example. "Jesus said, believe ye that I am able to do this? Yea Lord. Then he touched their eyes saying, according to your faith be it unto you." No doubt, the degree and duration of the restoration, was in proportion to the degree and duration of faith of the afflicted. These events took place before the introduction of modern "follow-up" records. It is worthy of note that it was customary to utilize faith in conjunction with certain ritual performances, such as the laying on of hands, or anointing with oils, a very commendable procedure, deplorably neglected by many of our profession, and used successfully by certain irregular practitioners, sometimes to the discredit of the licensed medical profession. The demand for this combined form of treatment is to-day as great, if not actually greater, than it was in the life time of St. Paul. During the last half century, coincident with enormous advances in commerce, science, and education generally, one notes with apprehension the passing of the good old family doctor, the rapid development of the specialist, and a tendency to divorce the art from the science of medicine, at the expense of the practiced art. *Post hoc*, or *propter hoc*, one sees a mushroom growth of cults and devices clothed in divers raiments ministering unto the believers, dispensing hope, and sometimes comfort, in return for faith, and certain monetary considerations. In my opinion it is the old story of demand calling vainly upon the orthodox until at last supplied by the unorthodox.

Honest treatment by means of suggestion is not fraud, but, unfortunately, it may be easily contaminated with fraud. The profession today looks askance at one of its members who employs suggestion extensively in his practice. If in the process of development of the ultra-scientific specialization of the practice of medicine, the ancient art be neglected and forgotten, one might imagine that a few generations hence the scope of the fully qualified, licensed physician might become so contracted and the field of the irregular practitioner and vendor of nostrums so expanded, that the ninety and nine might be found in the fold of the so-called irregular, leaving one in the fold of the recognized physician.

The psycho-neurotic is with us and will be with us. He may be found in every walk of life, both on and off the stage. Many of his traits are recognized, and capitalized in fiction. George Bernard Shaw has recognized and graphically portrayed him. Yet he is little more understood than in the days when Shakespeare drafted the characters for the story of Hamlet. He may be just the common pessimist, obliged to run his race through life handicapped by an irritating psychic hobble; or he may be the terror-stricken victim of a more or less complete emotional disorientation, groping blindly for a means of escape from an apparently boundless dungeon of despair and mental suffering. What he needs is confidence, then self-confidence, and a guiding hand in the reorganization of his disorganized emotions.

As long as this god, the subconscious mind, new or old, continues to be worshipped without being understood, so long will there be priests to tend his altars. Whenever the supply of priests, recruited from within the ranks of the profession, fails to satisfy the public demand, the necessary complement will continue to be supplied from without the ranks, forever and forever, unto the end of time.

Bladder Regurgitation Causes Ascending Infections of Urinary Tract.—Because of its bearing on ascending types of renal infections, regurgitation of vesical contents was made the subject of a special study by Graves and Davidoff. The occurrence of regurgitation was first studied in seventy-three normal rabbits, the bladders of which were slowly filled with warm physiologic solution of sodium chlorid. The phenomenon was observed in 73.7 per cent. of these cases. In this series attention was particularly concentrated on the relation of the bladder to reflux. In a second group of animals, the ureters had been rendered abnormal by previous operative procedures. Regurgitation was produed in 78.7 per cent. of the attempts. Several animals were subjected to complete urinary obstruction for the purpose of producing regurgitation as a result of prolonged retention. In a final series reflux was studied in the intact animal, and the phenomenon was witnessed through the fluoroscope in six of eleven experiments. On the basis of this work the authors believe that bladder regurgitation may be accountable for ascending infections of the urinary tract, particularly in cases of vesical neck obstruction.—*Jour. Urology,* Sept., 1923.

Choice of Digitalis Preparations.—In a report issued by the German Council on Pharmacy and Chemistry on dependable preparations of digitalis, seventeen were analyzed, as also eleven other heart stimulants not containing digitalis. The final verdict lists twelve proprietary preparations, but pulverized digitalis leaves heads the list as the preferable means for administering digitalis, especially in the convenient pill form (0.5 or 1 gm.). Strophanthin is the only heart tonic endorsed outside of digitalis. The infusion of digitalis is denounced as it irritates the stomach, is not durable, and requires nearly double the dose of the leaves.

CONDITIONS IN CANADA IN THE COMBAT AGAINST TUBERCULOSIS

An address delivered before the Mississippi Valley League of Anti-Tuberculosis Societies at their annual banquet, Evansville, Ind., Oct. 9th, 1923.

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Ottawa

IN Canada we have no organizations such as yours, with their State subsidiaries and county and municipal offshoots. The Canadian Tuberculosis Association does not receive any financial support from the non-Dominion-wide organizations. We lend aid in every possible way but accept no financial assistance from local fields, leaving these absolutely intact as a resource from which the local requirements may be obtained. Our organizations are therefore not bound together by any joint annual effort to obtain money. This may be detrimental, but every unit in Canada is entirely autonomous.

Sanatorium Centres and Efforts.—Most of our counties could not support a 100-bed sanatorium. We do not favour the creation of units smaller than this. It seems too great an overhead charge to provide an efficient resident medical staff, laboratories and x-ray services for smaller units. The tendency in Canada outside of Ontario is toward Government ownership, or at least backing; preferably administration by a lay commission, non-elective, partly appointed by the Government and partly by any other representative means. This grants us civilian administration free from political influence. It assures upkeep and first class equipment both as to medical and nursing personnel, as well as technical appliances. It insures public interest and approval. In Manitoba the sanatorium is assisted but not owned by the provincial Government, and somewhat the same relation subsists in Saskatchewan. In British Columbia and Nova Scotia they are under direct Government control, and in New Brunswick and in Alberta they soon will be. Quebec institutions are for the most part administered for the Government by Church Sisters and very efficiently too.

Official Agencies vs. Voluntary.—An efficient city health department with an active division of tuberculosis for co-ordinating nursing effort and the follow-up work of contacts in schools, homes and in industry and the collection by attendance at clinics of all facts pertaining to suspects, and to those requiring assistance in their homes, appears to me the best plan. Toronto has this and gets every case under treatment, even paying six institutions outside of Toronto for upkeep of its cases. Seven clinics are operated, and over 100 nurses are employed in school and other public health work. The follow-up is splendid. Their corrected death rate from tuberculosis for 1922 was a little over 40 per 100,000 living.

Hamilton, fifty miles away, obtains just as low a death rate through the operation of a splendid health association, which operates and supports over 350 beds. This city has a population over 120,000 and a death rate from tuberculosis in 1922 very similar to Toronto. Tuberculosis work as a hobby surpasses everything else in popularity, in Hamilton. Four hundred of its leading citizens from all callings of life sat down at dinner for their annual meeting last spring.

We have reported to us in Canada, over 50 clinics in operation for diseases of the chest, outside of the institutions for treatment. We have two schemes for increasing these. The Provincial Red Cross Society of Ontario made us a grant to pay the travelling expenses and cost of attendance for the medical experts of eight Ontario sanatoria to two municipalities in their several neighbourhoods, employing public health nurses. They proceed to the municipalities periodically and examine all cases referred through the practising physicians or the medical officer of health, who is usually the doctor for indigents.

Three provinces have travelling diagnosticians. Two are making provision to secure a similar service. Our association is planning to encourage financially this arrangement in every province by a grant of $5,000 for three years' service of men who are to do field work only, and who will be paid at least $3,500 a year and expenses.

Quebec province plans to open eight child welfare and anti-tuberculosis dispensaries at an annual cost each of $12,500.

We have had a survey made by a provincial royal commission in Saskatchewan of school age children, white and Indian. Its findings were very instructive. We therefore offered $1,000 to each of the other provinces towards the cost of a similar undertaking. The funds used were furnished by the Canadian Red Cross Society. British Columbia, Quebec and Ontario have completed the work. A fourth one is to be done in Grand Mere, P.Q. Manitoba and Alberta are applying for the privilege, and Nova Scotia and New Brunswick may follow. It is not that we expect to find or establish new facts for the profession at large, but we hope to get the minds of the people of each province centered on the findings revealed in such a survey and thus stimulate interest and assistance.

A five-year demonstration is being arranged at Three Rivers, P.Q., a city with a population of 25,000. The cost will be $31,000 annually, exclusive of charges for treatment of the disease. The health centre is now nearly completed with an x-ray equipment, laboratory and other appointments in keeping. It is entirely controlled by the Provincial Board of Health. Our association has arranged for half of the annual cost. The energetic support being granted to the work by the clergy, leading citizens and industrial organizations assures success from the start.

Facilities for Treatment.—We have in Canada to-day over 4,000 sanatorium beds for the tuberculous, or 4.6 per 10,000 people. They are distributed by provinces, as follows:—

Prince Edward Island	0
Quebec	less than 4.6
Saskatchewan	
Alberta	
British Columbia	Dominion average
Nova Scotia	5.6
Ontario	over 6 beds per 10,000 people
Manitoba	
New Brunswick	

Increased accommodation is under way in four provinces now.

We have beds in sanatoria for tuberculous children reported as follows:—

New Brunswick	1 in every		12	beds
Quebec	1 "	"	8.4	"
Ontario	1 "	"	5.7	"
Saskatchewan	1 "	"	4.2	"

Costs.—Our president, Dr. C. D. Parfitt, estimates the capital cost to date is $10,000,000. Last year, I believe, we spent $5,000,000 on treatment. I know of $3,000,000 spent for treatment in public ward beds. Over $1,000,000 came from eight provincial treasuries for assistance in the cost of 800,000 hospital days in 3,659 sanatorium beds. The average cost per diem was $3.00.

The cost of treatment to date for our ex-soldiers amounted to $3,500,000 for capital expenditure and $7,700,000 for treatment of 10,240 patients. About 1,500 died while on charge, 7,500 were discharged as cured and 1,000 are still on strength. We spent $900,000 on vocational training; one-quarter for training, three-quarters for pay and allowances. We have already paid $14,000,000 to tuberculous pensioners, not including payments to dependents of deceased tuberculous soldiers. We have 5,000 pensioners now classified in the tuberculous group.

We hope to assemble $50,000 for research work for a ten-year period, one of three universities contributing a like amount to the scheme. Our first and only contact for this financial assistance has been anything but discouraging.

Results.—We had in Canada 7,707 deaths from tuberculosis in the nine provinces during 1922, or a rate of 86.5 per 100,000 living. The rates by provinces are from Atlantic to Pacific:—

Prince Edward Island	127
Nova Scotia	132
New Brunswick	107
Quebec	122
Ontario	66
Manitoba	60
Saskatchewan	44
Alberta	51
British Columbia	74

We are quite active in our own way. Our Governments are all appreciative. We are very interested observers of your efforts and results. We have Prof. Dreyer's Antigen, obtained from defatted tubercle bacilli, and it is being tried out in several centres, thanks to the initiative of the Connaught Anti-Toxin Laboratories of the University of Toronto.

I extend to you the greetings of the Canadian Tuberculosis Association and my sincere thanks for the privilege of addressing you.

THE OCULAR MALINGERER*

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THE frequency of malingering varies in different countries, and, in any country, it bears a pretty direct ratio to the liberality of its compensation laws and industrial insurance acts. As a rule the beneficiaries of these acts feel that they are not liberally dealt with in matters of compensation, and in many cases, they are prone to make as much as possible of any accident or disability be it ever so trivial, and to exaggerate symptoms or even manufacture them.

It may be that a person had an amblyopic eye preceding an injury, as, from difference in refractive condition of the two eyes and failure to develop binocular vision, or from disease. It is also possible that he was unaware of this amblyopia prior to his accident, and in such case, he most certainly is likely to attribute the condition to his accident. If he were unaware of his amblyopia prior to his accident, he, of course, cannot be classified as a malingerer, as he is merely labouring under a misapprehension of what his eye condition really was previous to his accident.

The chief objects of malingering are: (1) To secure damages; (2) To obtain pensions and insurance compensations; (3) To avoid military duty; (4) To gain admittance to a charitable institution; (5) To secure alms; (6) Children sometimes pretend defective vision to avoid school duties. Children living in rural parts have been known to gratify their desire to see the city by declaring defect of vision, thereby securing a trip to the city to see a specialist.

The type of malingering may assume any of the following forms: (1) Simulation of total blindness; (2) of monocular blindness; (3) of an exaggeration of diminished vision; (4) of diminished vision where none exists; (5) of paralyzed muscles of eye or eyelids; (6) of an inability to use the eye on account of weakness, photophobia, dizziness, dazzling, spasm of eyelids, etc.: (7) of contraction of the visual field, and scotomata.

We are led to suspect simulation by the lack of agreement between the results of the functional testing and of the objective examinations, or, the individual functions give contrary results, inasmuch as the visual acuity, the field of vision, the color sense, etc., do not stand in right relation with each other, and with the result of the objective examination.

In making the examination, it is fortunate if we can impart to the person being examined the impression that he has our sympathy in his trouble, rather than have him harbour the impression that he is being examined by one who does not believe his statements, and is endeavouring to trap him. This is much easier of accomplishment with the person who is referred to the oculist for special examination and report for the first time, than with him who has already been referred by a defending company or party to several oculists, as his previous experience may have excited his suspicion, and developed his ability in being on his guard.

The procedure should consist of a thorough examination of the eyes externally and with the ophthalmoscope. His refraction should be accurately estimated, and most of the tests should be made with the person wearing the correction of any refractive error he may possess.

The objective tests of blindness depend mainly upon two points: (1) Reaction of the pupil; (2) Direction of the visual axis. In testing the reaction of the pupil by ordinary diffuse daylight, have the person directly facing the window, and have him gaze at a distant object while he holds his hand across the eye that is not being examined, in order to exclude the light therefrom. Note the size of the pupil in the eye that is being tested, and then exclude the light therefrom by holding a hand across it for five or six seconds. On removing your hand, in the case of the light reflex being normal, you will find that the pupil has enlarged considerably. The enlargement or dilatation remains about half a second, and then is followed by a very decided contraction, according to the intensity of the illumination. This contraction is followed by a dilatation, and that by a still more moderate contraction, until at last the pupil becomes stationary in a condition of more or less moderate contraction. By the rapidity and amplitude of these pupillary excursions one decides as to whether the light reflex is normal or abnormal.

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*Read before the Eye, Ear, Nose and Throat Section at the Annual Meeting of the Canadian Medical Association, Montreal, June, 1923.

Reaction of the pupil to light may not take place even when sight exists, as when synechiae are present, or in paralytic mydriasis. The pupils should be very thoroughly examined for posterior synechiae, and if necessary, a mydriatic used to establish their condition. If the patient has a dilated pupil when first seen, it may have been artificially produced by a mydriatic. Usually such cases may be detected by the mydriasis, as a rule, being nearly or quite *ad maximum*, in contra distinction to the more moderate mydriasis generally present in the genuinely blind eye. Shrewd malingerers often use a weak solution of the drug, or delay their appearance for examination until the pupillary dilatation has somewhat subsided. Dilatation of the pupil being an almost constant result in amaurosis, the absence of this symptom is exceedingly significant. Also, contraction of the pupil to light, or consensual reaction (*i.e.* reaction of the pupil of the other eye when the light is applied to the alleged blind one) forms strong ground for suspecting simulation.

There are rare cases, however, in which, in the presence of actual blindness, the pupillary reflex for light is still maintained. Such are:

(1) When the lesion is situated high up in the optic pathway above where the fibres of the reflex are branch off to the centre for the pupillary movements.

(2) When the lesion is in the visual area in the occipital cortex. The lesion in both cases would need to be bilateral, otherwise, hemianopsia, and not total blindness of an eye would result. This is therefore very rare. It may occur in uraemia, but is temporary, or other severe symptoms develop.

(3) Sometimes blindness may be present in disease of the optic nerve itself, and still have light reflex of the pupil. This can be explained only on the hypothesis that the fibres for the conduction of the light reflex are more resistant than those conveying visual impressions.

(4) Sometimes in retinal degeneration and blindness a very slow reaction to light takes place (Leber), the pupil dilating very gradually in the dark, and contracting very gradually again on return to light, and this in the absence of light perception.

The absence of the physiological stimulus of binocular fixation of vision allows a blind, or partially blind eye, to assume the anatomical position of rest, which is upward and outward, and we find in the case of an eye that is partially or totally blind, that it generally fails to maintain proper fixation. When, therefore, perfect parallelism exists under all conditions, it is good evidence of the presence of sight, and of sight sufficiently good to produce single binocular vision.

Additional tests of simulation of bilateral amaurosis:

Schmidt-Rimpler test.—The examiner directs the patient to look at his own hand. A malingerer, especially if ignorant, will now and then purposely look elsewhere than at his hand, whereas, a person blind for either a short or a long time, experiences no difficulty whatever in fixing either of his hands with his visual axes.

Burghardt's test.—This is a modification of the Schmidt-Rimpler test, the person being requested to put out the forefinger of one hand, and then touch the tip of it with the forefinger of the other hand. People actually blind experience no difficulty in doing this, but the malingerer is unlikely to accomplish it.

Attitude Test.—The amaurotic person has a staring, fixed, unmeaning look of the eyes, which is very soon acquired by those who are really blind, and which is familiar to the oculist.

Of some importance also is the short stepping of the really blind, together with the upward turning of the face, and a generally "listening" expression. Threatening movements towards the person will occasionally throw him off his guard, care being taken to make no noise, or set current of air in motion, as these often alarm persons truly blind. Sometimes an individual's ability to see has been elicited by suddenly bringing a live mouse before his face. Observation of these cases, when they are unaware that they are being observed, often reveals undoubted evidence of their ability to see.

Detection of malingering of monocular blindness.

Harlan's test.—Place a pair of trial frames on the patient. Before the seeing eye place a 10 dioptre convex lens. Have patient read while both eyes are open; if he succeed, it is with the eye he claimed to be defective, and his answer indicates approximately the degree of his visual acuity.

Prism and Maddox rod test.—Begin by covering the supposed blind eye, and by placing the prism so that it only partially covers the pupil, show him that he can see two lights with the one eye only. Then expose both eyes and introduce the Maddox rod. If he see both the red streak and the light, he must be seeing with both eyes.

Double prism test.—Place double prism with bases together in such a way as to produce monocular diplopia. If he see three lights he is seeing with the alleged blind eye.

Cuignet test.—A lighted candle is brought before the good eye, and is slowly carried towards the blind eye. Patient is detected if he still declares he sees the candle when it has reached a position where it is concealed from the sound eye by the nose.

Bar-reading test.—Direct the person to read from a book, holding quite still both the head and the book. Insert a pencil or narrow ruler vertically between the eyes and the book. If he continue to read uninterruptedly, he is undoubtedly seeing with both eyes, because, did he not see with one eye, such letters as were quite invisible to the other (on account of the pencil intervening between that other eye and those letters), he could not read them. Words unrelated in sense are best for this test, as there is less liklihood of the obstructed words being guessed.

Alfred Graefe test.—Have the person hold the professedly bad eye closed. Then set before the sound eye a prism in such a position that the thick edge thereof extends horizontally across the pupil. The person, of course, sees double, a fact that he will readily admit, because, so far, the professedly unseeing eye has not been called in question. Then have him uncover the "unseeing" eye, the examiner at the same time moving the prism so that it completely covers the pupil. If he still see double, he is seeing with the alleged blind eye. This test has an especial advantage in that, unknown to the person the visual acuity of each eye can be accurately estimated. This is accomplished by having him read first one, and then the other of the twin images.

In simpler form this test may be carried out by placing a 10 dioptre prism before the sound eye. If he admit seeing double he is seeing with both eyes. Here, however, when the alleged blind eye is manifestly under examination he will not invariably confess to seeing double.

Crossed diplopia test.—Place a prism (8 or 10 dioptre) before the alleged blind eye. If that is a seeing eye it will make an excursion inward, involuntarily, for the sake of single vision.

Vieusse test.— On a plain stereoscopic card are placed two wafers of different colours, one red for instance, and the other blue, at a distance in the case of each wafer of ½ cm. from a vertical line dividing the card in halves. When so small a distance separates the wafers, viz 1 cm., the wafer on the right side of the card appears to be on the left, and the wafer which is on the left side of the card appears to be on the right. The card is placed in a sterescope, and the person requested to look at the card through the instrument. If he admit that he sees both wafers, then of course he is seeing with both eyes. If, on the other hand, he confess to seeing one wafer only, he is asked to state the colour of that wafer. He will almost certainly, if malingering, name the colour of the wafer which appears to be on the side of the sound eye, which unmasks him, as this is the one that would be seen by the alleged blind eye.

Perhaps a better way is to have a horizontal line on one of the halves of the card, a vertical line on the other, these lines occupying such positions that when seen through a stereoscope by a pair of sound eyes, they form a cross. If, then, a person really blind in one eye looks at this card through the instrument, he will see either the horizontal line only, or else the vertical line only. If he admit seeing a cross he is malingering.

Test with 6 dioptre convex spherical lens.—The normal eye is rendered myopic with the 6 dioptre convex spherical lens placed before it. The test type is placed very close to the eyes and the patient requested to read. Gradually move the test card away from the eyes until it is beyond the focus of the seeing eye. If the person continues to read, he is reading with the alleged blind eye, and the degree of vision is approximately measured thereby.

Test with colored letters.—The transparent coloured letters (red and green) alternating, and on black background, are much used in this test. With the red glass placed before the sound eye, if he be then able to read the green letters, he must be seeing with the eye supposed to be blind, as the green letters are not transmitted through the red glass, green being the complementary colour of red.

Letters are written on white paper with a black and a red pencil alternately. The person is told to read the letters rapidly while a red glass is placed before the sound eye. If he read the whole of the letters, it is proof that he is able to read with the eye he claims to be blind, for the sound eye, looking through the red glass, cannot see the red letters, since these now offer no contrast to the background which also appears red. The acuity of vision in the supposed blind eye can also be estimated by this test.

Detection of simulation of bilateral amblyopia.—It is always ground for suspicion when the person in reading aloud the test type, declares that he can read no further, although, thus far, he has made no mistake in identifying all the letters. A truly honest reader will almost invariably miscall the most difficult letters (for instance B or S) in one line, before declaring his inability to read any of the letters of the next. Again, if he miscall only certain letters in a line and these are the easiest letters in that line (for instance T and L), this is ground for some suspicion.

Repeated tests made with test cards ending with lines of different sized type on different days or occasions of testing (as Snellen 40 on one occasion, Snellen 20 or 10 on another), will now and then suffice to expose the simulation of bilateral amblyopia, the malingerer believing that on each occasion, he should, to be consistent, leave off reading at exactly the same number of lines from the bottom of the card.

Unsuspected observation from a neighbouring apartment is sometimes resorted to, and occasionally from such a coign of vantage, the person will be observed to take up books and papers and examine them critically.

In simulated amblyopia, the presence or absence of mydriasis, and the presence or absence of the pupillary light reflex, are, of course, very much less to be depended upon as tests for malingering than in cases of simulated amaurosis. In fact, simulated, bilateral, moderate amblyopia is the most difficult variety of important ocular malingering to expose.

Mirror test.—If the person is pretending to have only a slight defect of vision, the test with the mirror in one of the various ways is of value. Use a chart with letters like H or O, which appear the same both ways, or two charts, one with reverse letters. Place the person midway between a mirror and a chart at which he looks, then have him read the smallest he can. Now have him turn halfway round and read them in the mirror. The distance by the mirror is three times as great and his visual acuity is measured accordingly.

Tests for the simulation of the concentric contraction of the visual field, and scotomata.—This form of simulation is rare. Feigning concentric contraction of the visual field is more common than feigning scotomata, and generally the contraction feigned is of high degree, as moderate contraction would not constitute good ground for heavy damages. The person should be examined on various days, and the separate results written down and carefully compared. By taking the size of the field as a whole, and also the size of the various scotomata different distances, almost any malingerer can be exposed.

Tests for the simulation of weakness and fatigue of vision.—As genuine symptoms, weakness and fatigue are almost always due to errors of refraction, to paresis or paralysis of the ciliary muscles, to various affections of the extrinsic muscles, to or neurasthenia or hysteria. The physical signs of these various disorders will be present. Sometimes rapid exhaustion of the eyes does really occur as an isolated symptom, and then the question of malingering or no malingering is very difficult to answer. Repeated testing is unlikely to develop much.

Actual detective work in such cases is sometimes valuable, and at times such persons have been found to spend a considerable number of hours in writing and reading. Such a person may at times, for an attractive wage, consent to copy fine print for many hours daily or nightly, especially if he believe that he will not be subject to damaging observation.

Though much apparatus has been devised to detect the malingerer, much of it ingenious, and some of it complicated, the tests herein referred to have been confined to those that may be carried out with the equipment that is common to every oculist's office.

INJURIES TO THE EYES FROM BROKEN GLASSES

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INJURIES, or at least severe injuries, to the eyes from broken spectacles or eyeglasses are fortunately of very rare occurrence, although it is possible many minor injuries of this nature are never placed on record. In 1914, Hans Lauber reckoned the frequency of this form of injury as one in thirty thousand patients. Some writers incline to a very much lower figure.

I consider that minor injuries to the eyelids from broken glasses are fairly common; that injuries to the eyeball itself, while much less frequent than injuries to the lids, are nevertheless more common than a perusal of the journals devoted to ophthalmology would lead one to suppose. The reason of this is that in the great majority of cases they are slight superficial wounds of the cornea and sclera, and are treated by the general practitioner, or if they go to the outdoor department of a general hospital are treated by the house surgeon on duty in the out-door department, and recover so quickly that they never come under the care of an eye specialist; the slight injury to the eye being often cloaked under a more obvious injury to the lids and face, many of these cases being the results of assaults or brawls.

The first case of this nature that came under my observation was in 1909 when acting as assistant to Mr. Stephen Mayou at the Central London Ophthalmic Hospital. A bicyclist wearing spectacles crashed into a cart that came to an unexpected stop while he was riding behind it. One eye was so severely lacerated by a fragment of his broken spectacles that it had to be removed.

One day early in December, 1915, while prescribing glasses for a little boy, the mother asked me, as mothers often do, if there was not danger to the child's eyes from the spectacles getting broken. I replied that I had never seen a case of a child getting injured in that way. By a curious coincidence, before the end of that month three cases of injury to the eyes by broken glasses came under my care, and one of the cases was that of a child. In the last eleven years in Montreal I have had only eight cases of injury to the eye from broken glasses. In only one case was the injury so severe that the eyeball had to be removed.

In two cases the eyeball was so severely damaged that an operation for prolapse of iris had to be performed, but in each case vision equal to one-half of normal was finally obtained.

In two cases the injury was severe, but the eyeball was not penetrated, and normal sight was obtained.

In three cases the injury was not dangerous. In the case of the child the injury was received while trying to spin a top.

In two cases the injury was received in a fight, and one of these lost his eye which had to be removed.

One case was due to the bursting of an emery wheel.

Three cases were due to accidental blows from hands or instruments held in the hand.

One case was due to a large flying particle of metal.

It is worth noting that in five of these eight cases defective vision was present.

The child had strabismus with moderate hyperopia.

One case had an amblyopic eye, and was severely injured in his good eye, losing the lens.

One case had high myopia.

In one case the injury was to an eye which already had defective vision, due to a previous injury.

One case had moderate myopia.

With regard to the question whether there is more risk of accident from spectacles or eyeglasses; in these eight cases, four were wearing spectacles, and four were wearing eyeglasses.

The child, and three of the severe cases were wearing spectacles; one of these was hurt by a bursting emery wheel; one was injured in a fight; one was accidentally struck by a shovel in the hand of a fellow workman. In these last two cases if they had been wearing eyeglasses instead of spectacles they might have been better off, as when struck, eyeglasses are much more easily dislodged than spectacles.

The two following incidents show the difference often resulting from receiving blows on spectacles or eyeglasses. While crossing Westmount Park some years ago, while wearing eyeglasses, I heard a shout, and looked up just in time to receive a baseball coming with great force on its first bounce; it struck the outer tip of my eyeglasses, and the outer end of the upper orbital ridge. Owing to the give of the glasses they were torn off and thrown some feet but not broken. If I had been wearing rigid spectacles, I would probably have received a very severe injury, possibly even losing the eye.

On a camping trip, while smashing wood with an axe while wearing spectacles, a piece flew up and struck the outer edge of the spectacles a severe blow. The side struck fortunately broke off at the nose piece, and I picked up the shattered fragments, and the side piece two or three feet behind me. The nose piece and unbroken glass remained in position.

Injuries, and severe ones at that, are frequent to people breaking wood in this fashion, namely smashing a long thin piece in the centre.

Eyeglasses are probably safer than spectacles, but are not suitable in the case of children.

Accidents to children's eyes from broken glasses are very rare; and even in children glasses would often act as a protection. In the last three cases in which I have had to remove a child's eye following an injury, wearing glasses might have saved the eye in each case. In two cases the eye was injured by a firecracker, and in the other by a splinter of glass from a broken window.

In adults, where this type of injury is received, the eye would often have been injured even if the person had not been wearing glasses. In the case above, due to the bursting of an emery wheel, the glasses undoubtedly saved the eye from being lost altogether.

In the case of adults working as machinists glasses are a great protection; and we frequently see their glasses with a rough surface from the number of foreign particles that have struck the glass. For those working on emery wheels they are indispensable, and it is against the law to work on an emery wheel without a pair of protective goggles.

In the case of the ordinary person glasses frequently save the eye from foreign particles getting in the eye, while travelling by train, or even walking the streets. The rapidity with which the lids close before a threatened damage is remarkable when one considers that the warning message has to be carried by the visual path back to the brain, and then relayed over to the motor centre, and carried back to the muscles of the lids. The momentary resistance offered by glasses to even a severe blow as from flying metal, gives the lids a precious opportunity, which they are quick to seize, to shut tight, and try and ward off the threatened danger at their own expense from the eyes which they so faithfully guard. By wearing glasses, a person runs no extra risk to his eyes, if anything he has added an outer line of defence which must be broken or circumvented, before his eye can be injured; a line of defence which wards off many an injury to those exposed to this type of injury.

MULTIPLE MYELOMA

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MY excuse for presenting a paper on this subject at the present time is, first, because there is such a meagre mention of this condition, either in the ordinary medical literature, or in the journals on radiology, and also the nearly complete absence of any mention of the radiographic appearance. Second, because of the fact that I had a case recently in which the symptoms did not conform very closely to those usually ascribed to the disease, and in which the diagnosis was first made by the radiographic appearance, and later confirmed by autopsy.

Probably the most comprehensive definition of this disease is that given by Ewing in his book "Neoplastic Tumours," where he defines "multiple myeloma" as " a specific malignant tumour of the bone marrow, arising probably from a single cell type, characterized by multiple foci of origin, a uniform structure composed of plasma cells, has a fatal termination, rarely gives rise to metastases." McCallum believes that this disease is a systemic infection of the marrow cells since it occurs simultaneously in many different bones and nowhere else.

In 1847, Henry Bence-Jones reported having found in the urine of a patient with osteomalacia, a peculiar form of protein, which was characterized by its behaviour towards nitric acid, and which has since been known as Bence-Jones protein. Ewing gives McIntyre the credit for first describing this disease in 1850, under the term "Mollities ossium." He also reported finding Bence-Jones protein in the urine. Rustizky in 1873 recognized this disease as a specific infection of the bone marrow, and classified it as a "myeloma." In 1889 Kahler described a case with Bence-Jones protein which was diagnosed as osteomalacia, but at autopsy proved to be multiple myeloma. Kahler suggested that the Bence-Jones reaction might be diagnostic of myeloma.

According to Miller and Baetjer 80% of patients with myeloma have Bence-Jones protein, but it has also been found in many other conditions, such as leukemia, nephritis, myxœdema, carcinoma, etc., so that it is not pathognomonic. Also, the idea has been expressed that, anatomically speaking, a myeloid tumour is not malignant, but it must be admitted that because of its incurable nature, it should be classed with the malignant diseases. Stewart in 1922, states that although no authentic cases of metastasis have been reported, the local malignancy of these tumours is so great that there can be no question as to their neoplastic nature, but he suggests that as they appear to arise from the osteoclasts, these tumours should be termed osteoclast sarcoma.

Multiple myeloma would appear to be a rare disease, as Woods in 1905 could only find 30 cases reported in the literature, and in 1920, barely 100 cases had been reported.

The pathological basis of this rare disease is the formation in the bone marrow of numerous masses which destroy the bones, and often penetrate the surrounding tissues, without, however, destroying them. The etiology of the disease is as yet quite obscure. Some authors hold that it is an indirect sequel of an infectious process. Others hold that it arises as the result of a trauma. In support of this theory "Oftedal" in the *J. A. M. A.* of 1921, reports the case of a farmer, age 41 years. His trouble dated from a trauma received when he was struck over the right chest with a fence rail. After about one year's time he developed multiple myeloma, which the writer believed was due to the trauma.

The disease occurs most frequently in males of from 20 to 60 years of age, and usually terminates fatally in from 6 to 18 months.

According to Ewing the ribs and sternum are the most common seats of the growths, while the vertebrae, skull, femur, and humerus are less frequently involved. Winkler observed in one case 28 separate tumours in the skull, while Hoffman reports three cases where the primary growths were in the ilium. The tumours form small multiple nodules varying in size from that of a bean to an orange, although occasionally no circumscribed tumours are present, but rather a diffuse infiltration. These multiple tumours begin in the marrow of the bones, and are grey, greyish red or yellowish red in colour. As they grow the bone tissue is absorbed, sometimes very rapidly, and as a result multiple perforations or spontaneous fractures occur. The surrounding tissues often become diffusely invaded.

Clinically, there are rheumatic pains in the back, trunk, and extremities. The first symptom is usually pain in an individual bone, due to an erosion of the periosteum, or a general toxaemia. There may be periodical recurring attacks of slight pain described as "colicky" or the pain may be continuous in nature. Recurring fever is sometimes observed, but usually the temperature is subnormal. As the disease progresses there is a rapid loss of weight and strength, with anaemia which is sometimes quite severe. The termination is usually marked by diarrhoea, dyspnoea, paralysis, and coma.

From the standpoint of diagnosis by means of the x-ray, if no visible bone change has taken place, the radiographic examination will of course be of no assistance, but in the majority of cases pathological condition of the bone is present, and if so, is usually of value in making a diagnosis. The differential diagnosis will usually lie between osteomalacia, sarcoma, carcinoma, and myeloma. First; osteomalacia never attacks the cranial bones, whereas myeloma very frequently does. Second; osteomalacia presents diffuse absorption of the calcium salts, whereas myeloma presents numerous circular areas of rarefaction of small size. Third; in osteomalacia owing to the absorption of the calcium salts, there is a pliability and a consequent change in the shape of the long bones, whereas in myeloma the contour is well preserved, but there is a tendency to spontaneous fractures. Primary carcinoma is never found in bone, so that as a general proposition, if a primary growth cannot be found, ahe probability is that the bone tumour is not carcinoma. Differentiation of secondary carcinoma, sarcoma, and myeloma is often difficult or impossible by the x-ray alone. A. B. Moore of the Mayo Clinic, stated recently, "that in their experience, the bony metastasis of all types of malignancy gave the same x-ray appearance," thus emphasizing the fallacy of attempting a cellular diagnosis by the x-ray alone, and Isaak gives it as his belief that it is impossible to differentiate myeloma from secondary tumours of the bone marrow. Assman points out that the bone defects in cases of multiple myeloma are apparently better circumscribed than in cancer metastasis, but that in many cases a definite differentiation by the x-ray alone is impossible. In cancer metastasis the process is usually less extensive, more diffuse, and is located near the nutrient artery to the bone.

The following case exhibits several rather unusual features:—

A boy, 12 years of age, weighing 70 pounds, was admitted to the hospital on July 13th, complaining of pain over lower maxilla, inability to open jaws freely, stiffness of neck and headache. His temperature was 102° F.; his pulse was 116; respirations 20.

Up until 2 months previously patient had been quite healthy, when he began to complain of pain and stiffness of the neck; now he holds the head rigid on walking. On July 19th, he complained of pain in left shoulder and arm, but no tenderness on pressure. On July 27th discharged from hospital, pain in arm less severe.

Re-admitted August 2nd, pain in arm much worse. Temperature 101° F., pulse 100, respirations 26. X-ray of shoulder, spine, and chest negative, but plates of right side of head showed numerous discrete areas of rarefaction about one half an inch in diameter in the right parietal bone. August 21st.—Pain has been absent for 2 or 3 days. Patient quite drowsy. Tumours can be made out on right side of head, and x-ray shows considerable extension of the diseased areas in the right parietal bone, and also involvement of the left parietal. On August 31st complained of pain in right shoulder. X-ray showed considerable bone destruction in the shaft below the epiphyseal line. September 11th x-ray showed a large tumour in the mediastinum. Bone destruction of both sides of the skull and the right humerus, but the left quite normal. Patient had continuous pain in shoulder and head. A troublesome cough developed, with weakness and drowsiness. He gradually became weaker, and died on September 26th.

Temperature while in hospital varied from 99° to 103°, with daily remissions; pulse from 100 to 150.

Autopsy findings.—On removing the sternum the mediastinal space is seen to be filled by a large, firm, fleshy-looking tumour, which is encapsulated: appears to press on the praecordium and partially surrounds the trachea. The surface of the left lung is covered with small white nodules. Scattered throughout the lung are numerous nodules varying in size from a few mms. to 2½ cms.

On the right side of the head are two large tumour masses which have eroded the scalp. On removing the scalp these masses appear to project through the skull, and numerous smaller masses are present beneath the bone. The base of the sphenoid and the petrous portion of the left temporal are much eroded by tumour growths.

Histological examination. — The mediastinal tissue consists of a fine reticulum, containing a few small blood vessels, and a collection of round cells, a great many of which appear to be of the plasma cell type. The tissue from the skull shows the same picture.

Diagnosis—Myeloma.—This case presented the following peculiarities:—

(1) No Bence-Jones protein was found at any time, although searched for repeatedly.

(2) Early age of the patient.

(3) Fairly extensive metastasis.

(4) High temperature.

(5) Rapid course of the disease; from onset until death, not more than five months in duration.

The Canadian Practitioner will issue a special Cancer Number next March. One of its aims will be to support the American Society for Control of Cancer in its efforts to educate the public regarding early recognition of the disease. An effort will be made, also, to give the general practitioner information respecting precancerous and early cancer conditions, believing that he alone is the proper one to make the early diagnosis and decide on the line of treatment.

Sir Arbuthnot Lane will give his opinions regarding chronic intestinal stasis as a cause of cancer. Among other English contributors will be Dr. A. C. Jordan, whose paper, read by him as President of the Hunterian Society and published in the *B.M.J.*, December 25, 1900, created great interest in Great Britain and America. Dr. Nathan Mutch and Sir Lenthall Cheatle will also furnish papers and Dr. Shaw-Mackenzie will give some of his results in research work carried out in the physiological laboratories of King's College.

It is expected that Dr. Degrais of Paris, will contribute a paper.

From the United States a number have promised to contribute, among them being Dr. Ochsner of Chicago, who will write on cancer of the uterus, Dr. Douglas Quick on cancer of the mouth, Dr. Johnston on cancer of the antrum, Dr. Lee on cancer of the breast, and probably Professor Ewing.

There will be several Toronto contributors, among them Professor Oscar Klotz, who will discuss the pathology of precancerous tissues. Dr. Tovell will describe x-ray diagnosis, Dr. Wells Ross cancer from the surgeon's standpoint, and Dr. Harrison the treatment of cancer by radium, dealing particularly with surface lesions.

Case Reports

HYPERNEPHROMA OF THE KIDNEY, ASSOCIATED WITH REPEATED ATTACKS OF HAEMATURIA AND METASTASES IN THE BONES

J. T. Ryan, M.D.

From the Department of Urology, Montreal General Hospital, Montreal

A white male, referred by Dr. E. J. Williams, Montreal; 46 years of age, engaged in office work, was admitted to the Montreal General Hospital into the service of Dr. F. S. Patch on June 15th, 1923, complaining of haematuria and pain in the left flank.

Personal History.—Born in Canada. Had measles and whooping cough in childhood. At sixteen years of age the tonsils were removed, but he has since been subject to mild attacks of tonsillitis. At eighteen years he had two attacks of left-sided pleurisy, with effusion. Was ill six weeks with each attack. At this time he had cough and night sweats which have since disappeared. Twelve years ago he had neuritis in the left arm. This has not troubled him since. Denied venereal disease. Has used tobacco and alcohol in moderation. Married twenty-one years; has five children alive and in good health. Wife had two stillborn children and one miscarriage at two months. He has had bilateral varicocele in a moderate degree for years.

Family History.—Unimportant; no history of tuberculosis.

Present Illness.—Began the morning of May 3rd, with passage of considerable quantity of blood in his urine, which at the time was painless. He attributed this to having spent a few strenuous hours in his garden on the preceding evening. A few hours later, while at his office, he was seized with pain in the left flank, at first mild, but gradually increasing in severity. This pain lasted throughout the day and remained localized. The bleeding continued for two days, the blood being bright red, intimately mixed with urine, and more marked at the beginning of the act. He rested quietly for sixteen days, resuming his work on May 19th. That night he had a similar haematuria, the blood being darker and the bleeding less profuse. This lasted but one day. Since then he has been at rest. There was no pain with this attack, but on the following day he complained of slight tenderness, which has persisted, in the left flank. He had two other slight attacks of bleeding, separated by a week's interval, each attack leaving the left flank distinctly more tender. His last attack of haematuria came on the day of his admission to hospital, and was quite severe. He has had no frequency, no urgency and no pain on micturition.

Present Condition.—The kidneys could not be palpated, but there was definite tenderness in the left costo-muscular angle. All systems other than the genito-urinary showed normal findings.

On rectal examination, the vesicles were palpable, but not abnormal. The median groove of prostate was identified. Bilateral varicocele was present.

Urine.—Turbid, brownish, acid. S.G. 1016—1026. Albumin double plus. Microscopically, numerous blood discs. Acid fast bacilli absent on two thorough examinations.

Blood.—Reds, 5,000,000; whites, 7,400; haemoglobin 85%; Wassermann negative.

June 16th.—Cystoscopic examination availed nothing, the time being spent in evacuating blood clots which were numerous and large enough to cause retention of urine. Second examination on June 20th showed distinct blood spurt from left ureteral orifice but no flow of urine was obtained from that side on catheterization. The right side was normal.

Routine x-ray of the genito-urinary tract was negative, but bony changes were noted, involving the entire right half of the pelvis, upper portion of the sacrum, and right half of the body of the 5th lumbar vertebrae. These were thought to be of a malignant character.

The sudden onset of haematuria, its intermittent character and the presence of tumours in the bones, pointed to tumour, and to a type which metastasizes with predilection in bony structures, viz.—hypernephroma. This diagnosis was confirmed at operation, June 25th, the tumour being situated at the upper pole of the kidney, growing down into the renal pelvis. The kidney was removed as a palliative operation, the patient making an uneventful recovery. The haematuria ceased at once, and has not returned.

The value of routine x-ray of the bony system in all cases in which tumour of the kidney is suspected is here strikingly demonstrated.

Retrospect

PERIRENAL INSUFFLATION

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Perirenal insufflation means infiltration of gas in the perirenal tissues. It is done in order to produce greater contrast densities on x-ray plates. The method introduced by Carelli and Sordella is described in an Argentine journal (not available to us). Carrelli has also demonstrated the method in London, New York, Paris and Berlin. Several reports upon the subject have appeared, notably, by Quinby in Boston, Chevassu and Maingot in Paris, and Rosenstein in Berlin.

Carelli's technique, as used by himself at a demonstration before the Royal Society of Medicine in London, has been described by Hernaman-Johnson[1]. The patient lies on the face and abdomen. A fine 10 c.m. needle is introduced opposite the second lumbar vertebrae, impinges on it and then is deflected to pass by its transverse process, when it is pushed into the perirenal tissues. The needle, which is left open in order to detect puncture of blood vessels is introduced about 6 cm. Penetration into the perirenal adipose tissue is indicated by manometer oscillations. Oxygen or carbon dioxide gas is then introduced by means of a pump to about 500 cc.. The patient is x-rayed at once. No great discomfort follows. The shadow of the kidney appears in a lake of gas. Carrelli states none of his cases has had perirenal infection.

Chevassu and Maingot[2], saw in their first case, following Carelli's method, a supraclavicular emphysema result, which caused them to change the technique. They introduced the needle into the costo-lumbar angle, outside the erector spinae muscle, the patient lying on the side as for a lumbar nephrectomy. The needle is directed inwards and upwards towards the lower pole of the kidney. The perirenal capsule is most voluminous and most superficial at this point. The needle must enter the perirenal capsule, that is, the space lying between the renal fascia, the fascia of Zuckerkandl and the true kidney capsule and must not penetrate the kidney. According to the fatness of the patient, the needle enters 5, 6 or 7cm.

In the following number of the same journal their further experiences are detailed[3]. They report the difficulty of penetrating with sureness the perirenal space, and, this being successfully accomplished, of the difficulties of interpretation, owing to the formation of gas pockets, etc. It cannot be gainsaid that in many cases, one secures x-rays in which the contour of the kidney is outlined with an intensity otherwise impossible. However, a satisfactory shadow is obtained in 80% of ordinary x-ray pictures of the kidneys. The method gives no information as to the kidney pelvis, and is by no means free from discomfort to the patient from the resultant tension. The technique is uncertain of realization, and should be reserved as a supplementary radiographic method.

M. Marion, during the discussion on this report, stated that Carelli had demonstrated the method on three cases in his clinic. In one, there was no accident, but the x-ray revealed nothing. It was thought that this failure was due to perinephritis, but operation revealed a kidney absolutely free. In the second case, a pneumo-peritoneum followed, and in the third, a mediastinal and cervical emphysema. Marion thinks that the method gives rise to errors in diagnosis, and should not be used as a routine measure.

Quinby[6] has fewer doubts about the technical difficulties mentioned by Chevassu and Maingot. He follows their method of approach, uses a lumbar puncture needle, collects the oxygen in a sterile litre flask connected with another flask twice this size and filled with sterile water. The water flask is inverted and flowing into the flask containing oxygen, displaces and forces the gas into the flask containing oxygen, displaces and forces the gas through the needle. If the needle is properly placed the flow of gas is obtained with only moderate pressure. If the flask has to be elevated more than two feet, the needle is not properly placed. Using oxygen, Quinby gets best results by making the x-ray exposure and injection of the kidney pelvis 12-14 hours later. Carbon dioxide has greater diffusibility than oxygen. One bad result followed. The patient at once showed pallor, sweating, faintness, laboured breathing and a slight cough, all of which disappeared in about thirty minutes. This patient had had previous kidney operations and probably had dense perirenal adhesions. In such a case, perirenal insufflation is contra-indicated.

Boeminghaus[4] reports the occurrence of a severe gas embolism of the right heart. This was probably due to penetration of an abnormally situated vein, as normally the pedicle vessels lie more mesially and more deeply than the selected site of puncture. He states that complete resorption of the insufflated oxygen results in two or three days.

Delherm and Laguerriere[5] suggest making the injection of this gas under fluoroscopic control. They point out that an image of the suprarenal gland is frequently obtained, and better illumination of calculi of the kidney and pelvis results from this method.

Perirenal insufflation with gas, as now used, seems to have but a narrow field of usefulness. In occasional cases, large and fat individuals, where the ureter is blocked by a stone, or the kidney pelvis cannot be injected, perirenal insufflation is of value. The concensus of opinion is that while the method is of value in selected cases, it should only be used when other and simpler methods of diagnosis fail to give sufficient information.

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Oral Prophylaxis and Preventive Dentistry.—The opportunities of the physician for lending his aid in establishing better dental conditions are many, says P. B. Wright, Pasadena, Calif. He can help the great work of oral prophylaxis. The prospective mother should be advised regarding her own teeth, and suggestions should be made as to diet during pregnancy. The old theory that dental operations at this period are harmful has been exploded. The mother should be instructed as to the periods of eruption of the deciduous teeth, if she has not received such information from her dentist, and should be advised regarding the importance of early care of the child's teeth. Inquiry should be made of each patient as to the condition of his or her teeth, and a routine inspection of the teeth, gums and oral mucous membrane should be given. Early recognition of narrow, contracted dental arches, and a crowded condition of the teeth, with malocclusion, may lead to the correction of the deformity before serious consequences result. Care of the teeth and oral cavity during illness and convalescence adds to the comfort of the patient and promotes prophylaxis. Carious teeth may harbour the germs of contagious disease. By givng consideration to the foregoing suggestions on oral prophylaxis and preventive dentistry, the physician may help in a remarkable degree and will add to the comfort, health and longevity of humanity.—*Jour. Am. Med. Ass.*, Nov. 10, 1923.

Editorial

FORECAST FOR THE COMING YEAR

WITH this issue the Editorial Board completes its task for the year. Doubtless many sins of omission and commission have at various times been inadvertently committed. Nevertheless, the Board looks back upon the past year's work as the accomplishment of an earnest effort to serve the profession in every province, and to advance the interests of all its members impartially.

In forecasting the work of the coming year, the Board desires to emphatically remind all members of the Canadian Medical Association of the fact that the *Journal* is their journal. The great aim of the Editor and of the members of the Board is to make the *Journal* truly representative of Canadian medical thought and activity, by publishing all important papers presented before its Dominion and every provincial association and recording all important research work carried on in Canadian universities and hospitals. To accomplish this it must have the assistance of the members of the Association, and reports from the various secretaries of important items suitable for publication must be received by the middle of the month so that they may appear in the issue of the following month. Delayed reports are of little value. News items of interest are requested from every province.

Original papers are always acceptable when concisely written and not too long. Space in the *Journal* is valuable and costs the Association money. Lengthy papers are seldom carefully read. Contributions may be forwarded directly to the office of the *Journal* or sent through the local secretaries. All will be carefully and sympathetically read by the Editor. Clinical reports of interesting cases, medical and surgical, are always valued, but the Editor desires to add to this statement that hospital card abbreviations should be replaced by good English and the report be followed by a summary of the chief points on which its interest depends.

It is hoped that all University teachers will from time to time use the pages of the *Journal* for editorial remarks and comments on recent advances in science and on new facts or researches of interest to the general profession; such editorial articles to be signed or not as the writer may desire. One of the most important departments of the *Journal* is that of abstracts from the leading journals of other countries, and it is the hope of the Editorial Board that this department during the coming year will be greatly enlarged and improved. Arrangements have been made for the co-operation in this department of many active workers, who will supply the *Journal* with concise and interesting abstracts culled from all the important medical journals English and American, and from the journals of our sister Dominions overseas. We have pleasure also in stating that it is the hope of the Board to increase the number of pages of reading matter in the *Journal* during the year.

THE TUBERCULOUS MAN AT HOME

THERE are men who can write attractively about subjects which may have become trite; and, what is more, they can write repeatedly, with unfailing attractiveness. A subject which may thus have lost its sharpness of interest to those not specializing in it is tuberculosis: a writer who can so restore their keenness of interest is Dr. David A. Stewart. How arresting is one of his opening sentences! "The tuberculous man at home is an end-product of our anti-tuberculous campaign." And then, "Whatever he may be or not be, our systems are pretty much on trial in him. If he is doing well physically, morally, industrially, we are considered to be doing well. If he is acting badly, ignorantly, wilfully, it is considered that we are making a failure. If he fails utterly, so do we fail in him...... What do we give; what can we give to carry with him upon his great adventure?"

There are the two fundamental points—the responsibility of the medical man in sending the patient back to his home, and the desire to go to the utmost limits in helping him, limits which may seem to lie even beyond those of medical responsibility.

The responsibility, of course, is great. It may be urged that the sending of the tuberculous case home is one of the weak points in our attack on the disease: that the economic and other factors to be considered would be better dealt with in the long run, if the sanatoriums and other institutions assumed his care more completely. But this would be taking for granted a state of public opinion which by no means exists. And Dr. Stewart faces the problem with an earnest thoroughness that takes full account of such objections.

He gives certain things to the patient thus sent forth; he would try to give him others. Diagnosis has been given, "and, let us hope, this diagnosis has been early, exact and adequate": also, treatment and instruction. What he would give him further is something that is much harder to give, for it is nearly a re-creation of the whole mental and spiritual outlook of the patient. He quotes Bushnell as saying that "the cure of tuberculosis is not medicine but a mode of life." And to support that mode of life there must be deep spiritual energy. In one passage there comes a faint echo of "Erehwon," "The tuberculous man at home....is the man who has been soundly converted; who has seen the error of his ways; who has turned over a new leaf......"

And this idealistic strain is not felt to be extravagant when he reminds us of the only too well recognized difficulties that the tuberculous man meets at home, living amongst normal busy people. "Some have so much to give up that life seems scarcely worth returning to. There is none who has not "something to give up."

He would give him work, and to anyone who sees and is troubled by the waste of energy in the tuberculous, a waste sometimes only apparent, but often very real, the judgment which Dr. Stewart shows is refreshingly clear and firm. It is very hard to steer between the demand for rest and the amount of work a tuberculous patient could and should do. Somewhere else, in a paper on "Rest," Dr. Stewart has said, "I believe twice as much in rest and in twice as much rest for tuberculous patients as I did ten years ago." That is an apophthegm which requires judgment for its application, but then the whole matter is one requiring that high qualification.

H. E. McD.

THE INFLUENCE OF THE WEATHER ON INFLUENZA

THE Bulletin of the National Research Council published in Washington was received a few days ago. Its contents are devoted to the discussion of the causes of the geographical variations in the intensity of the influenza epidemic of 1918 as manifested in the several cities of the United States. For instance the death rate from the epidemic during its first ten weeks was four times greater in Philadelphia than in Milwaukee, and three times greater in Pittsburgh than in Toledo. Among the possible explanations of the great difference in its intensity in different cities and the explosive violence of the epidemic, four are mentioned. First, both the bacteria and the human organism may be subject to certain inherent physiological rhythms which cause special vigor at some times and in some places. Second, it is equally possible that an increased vigor in bacterial activity may take place because of some special environment. Third, there may be both kinds of rhythms in vigor, physiological and environmental, and these may occur in both the human and in the bacterial organism and act sometimes together and sometimes at separate times. Fourth, bacteria of one kind may influence those of another kind in such a way that the accidental combination of the two at some special phase of their activity may induce great virulence. While acknowledging all these possibilities, one of the earlier problems to be solved is to determine how far environmental conditions appear to affect the virulence of the disease. The present study is therefore confined to an attempt to ascertain why the virulence of the epidemic varied from place to place, and does not touch the problem of its actual etiology. Careful investigation and study of the variations in virulence which took place in thirty-four large American cities as manifested by the excess mortality arising from the epidemic appeared to show that age and sex, the character of the population, the degree of crowding, the rate of recent growth, and the distance of the city from the Atlantic seaboard in no city played any appreciable part. In other words, the severity with which a city was hit by the epidemic appeared to bear no relation to its general sanitary status or to the efficiency of its health organization.

Of all the factors investigated the character of the weather alone appeared to have any fundamental significance in determining its virulence. This does not mean that the weather was in any sense a cause of the epidemic; and although it was recognized as an important causal factor in producing the variations in virulence there was no definite reason to think it the only factor; nor do the high co-efficients obtained imply that the weather was the chief agent in setting the date of the epidemic or in determining its intensity as compared with that of other epidemics. It is also not necessary to suppose that other epidemics will show exactly the same relationship as this one to weather conditions even though they may be strongly influenced by them. The epidemic of 1918 was so peculiar in its virulence, its rapid dissemination, and its fatality that it may well have been peculiar in its climatic relationships. Even if we have to admit that the weather is an important factor in causing variations in the virulence of influenza, we still have little evidence as to how its effects are produced. Presumably the weather has a depressing effect on the power of resistance to disease in individuals; it is also not improbable that the weather has an important influence upon the vigor, reproductive rate, and dissemination of the disease-bringing bacteria.

The object in presenting this report is partly to call attention to the necessity of investigating and applying to other regions and other epidemics the methods here employed, and also to urge the necessity of further experiments to determine just how far the human subject and the bacteria are influenced by the atmosphere and by other conditions which may increase or diminish the ravages of this disease.

ON DREAMS

PROFESSOR G. ELLIOTT SMITH, of University College, has prepared for publication a series of lectures delivered by the late Dr. W. H. R. Rivers at Cambridge University. The volume is entitled "Conflict and Dream." The pleasure of reading this interesting book on dream psychology must be tinged with regret that the author did not live to continue investigations so full of promise. Study of his own and of other persons' dreams led Rivers to accept, though with important modifications, Freud's scheme of the processes by which the dream is produced. The essential feature of Freud's teaching is that dreams as a whole have a meaning, and that their psychological origin can be traced with certainty and precision by means of his psycho-analytical technique—a teaching opposed to that previously held that the dream is an anarchical and chaotic revival of memory in images to which no meaning can be ascribed. The same forces which impel the individual into ceaseless mental and physical activity during the day may be assumed to seek expression and to control the thought processes during sleep. Dr. Rivers accepts this view. When he began to analyse his dreams he discovered that as soon as he became awake he was already having thoughts about a dream, the dream itself being clearly on his mind. He found that the dream images merged by insensible gradations into waking thoughts, and the solution of the dream came in a more or less spontaneous way. Basing his view on the personal study of dreams, a number of which are described in this volume, he suggests as an alternative to the wish-fulfilment theory, the hypothesis that the dream is a solution or attempted solution of a conflict which finds expression in ways characteristic of different levels of early experience.

From the standpoint of Freud the dream is to be regarded as a distorted expression of a primitive impulse seeking only its own end, and has no constructive value. Rivers, on the other hand, regarded the dream processes as more allied to the thoughts and processes of waking life. He describes a number of dreams in which he detected evidence of a constructive process, and suggested that the dream may be capable of solving or helping to solve practical problems presented in the course of daily life; he explained the superiority in this respect of the state of sleep to the waking life on the hypothesis that during sleep the conflict between opposing impulses is free and open, one impulse is not thwarted by another, so the imagination can apply itself without restraint to finding a solution of the conflict.

Rivers in these lectures gives only brief consideration to the relation of dreams to pathological mental processes. He believed that in mental disorder, as in dreams, the importance of early experience has been greatly exaggerated by Freud and his followers. In an interesting and important lecture on "Symbolism and Dreams," Rivers subjected Freud's theory of Universal Symbolism to criticism. Freud believes that the fundamental and perennial interests of mankind recreate afresh out of individual material stereotyped symbols, the interpretation of which can be supplied from a knowledge of myths, folk lore and primitive beliefs. Rivers believes that no systems of symbolization are of universal distribution and that the so-called innate symbolism is the result of a common tradition so prevalent that it influences every member of the community and becomes at an early stage of his life part of the furniture of the mind, part of a social heritage. It is to be hoped that his views on this subject expressed more fully in various papers may be collected shortly into a book.

A Clinical Study of Ureters.—Alexander Hamilton Peacock, Seattle, urges that the ureters be more carefully studied, for such study will often clear up obscure symptoms which have embarassed the diagnostician. The ureter should be thought of as a very distinctive organ, with its rythmic contraction and function quite independent of the balance of the urologic tract. The diagnosis of its lesions and the surgery to correct them must all be considered in a separate chapter from the rest of urology.—*Jour. Am. Med. Ass.*, Nov. 3, 1923.

Editorial Comments

A USEFUL DIET TABLE

For the most part food analyses are expressed in percentage values of carbohydrates, fats, proteins, water and salts, the quantity of food itself being given as a unitary or workable value. In clinical work, on the other hand, it is obvious that what is required is a unitary value for the specific carbohydrate, fat or protein content, and with this end in view Dr. H. S. Pemberton of Liverpool was led to devise this simple table which appears in the *British Medical Journal* (Aug. 21, 1923). The factors which determine the success and accuracy of any particular diet would appear to be the ease of original construction, an elasticity which allows if necessary of a daily change with a small demand only on the time and intelligence of helpers and patients. The table has been principally used in the dietetic management of chronic nephritis, diabetes mellitus, hyperchloridia, and achylia gastrica. In these conditions a specific intolerance of one or other of the elements of food is often manifested, and by the use of this table a control of the intake of the offending element may be obtained. The last section of this schedule shows the caloric requirements of the special patient per day, and is to be made up according to the age, occupation and severity of the disease, and will be subject to revision as tolerance varies.

Diet Scale

One ounce of carbohydrate or protein yields 120 calories. One ounce of fat yields 270 calories.

One ounce of carbohydrate is contained in—

1½ oz. dry oatmeal (contain 1-3 oz. protein, 1-10 oz. fat).
1½ oz. shredded wheat biscuits (contain ½ oz. protein).
12 Kalari biscuits (Callard).
I pint of milk (contains 2-3 oz. fat, 2-3 oz. protein).
1½ pints cream (contain 1 oz. protein, 6 oz. fat; rich cream contain 12 oz. fat).
5 oz. potatoes (contain 1-6 oz. protein).
5 oz. baked beans (contain 1-3 oz. protein, 1-10 oz. fat).
5 oz. boiled rice or macaroni.
1 2-3 oz. bread or toast (contain 1-6 oz. protein).
10 oz. strawberries, lemons, or oranges.
10 oz. Brazil nuts (contain 1½ oz. protein, 7 oz. fat).
10 oz. filbert nuts (contain 1 oz. protein, 7 oz. fat).
10 oz. carrots or onions.
20 oz. grape fruit.
20 oz. ripe olives (contain ½ oz. protein, 5 oz. fat).
6 oz. apples, currants, pears, cherries, grapes.
5 oz. plums, bananas, or prunes.
20 oz. tomatoes or radishes.
20 oz. lettuce (contain ½ oz. protein).
1 pint beer.
½ pint stout.
½ pint port wine.
Thrice-cooked spinach, celery, or cabbage contains no carbohydrates; the carbohydrate in soy bean or mushrooms is *not* assimilated.

One ounce of protein is contained in—

10 oz. smoked uncooked bacon (contain 6 oz. fat).
6 oz. ordinary uncooked bacon (contain 3 oz. fat).
5 oz. lean smoked ham (contain 1 oz. fat).
5 oz. lean uncooked beef or mutton (contain ½ oz fat).
4 oz. roasted lean beef or mutton (contain 1 oz. fat).
6½ oz. corned beef (contain 2 oz. fat).
5 oz. fresh fowl (contain 1½ oz. fat).
5 oz. boiled cod, haddock, sole, or whiting.
7 average sardines (contain 1 oz. fat).
2 large or 3 small hen's eggs (contain 1 oz. fat).
4 oz. cheese (contain 1½ oz. fat) (American, Cheddar, Cheshire).

One ounce of fat it contained in—

1 1·6 oz. fresh butter.
1 oz. oleo margarine.
1 oz. lard, cod-liver oil, olive oil.

One ounce of whisky, brandy, rum, or gin yields 105 calories.

Requirements: Calories per day in the form of—

oz. carbohydrates.
oz. proteins.
oz. fat.

References

E. P. Joslin; *Diabetic Manual*, 1919. P. Cammidge: *Glycosuria and Allied Conditions*, 1913.

We have received copies of publications Nos. 17 and 18 on "Safe water supplies for isolated houses and institutions where a municipal system is not available." No. 17 is an unabridged edition of 46 8-vo. pages. No. 18 is a homesteaders' edition of 34 pp. Both are well written and well illustrated and will prove of great service for farmers and all persons who want to settle in districts away from towns and cities. We congratulate the Department of Health on their publication.

A correspondent has forwarded to us a circular sent out by the Civil Service of Canada announcing open competitive examinations for several positions, among which is one for a medical officer for the Department of Health at an initial salary of $2,400.00 per annum which may be increased upon recommendation for efficient service at the rate of $120.00 per annum until a maximum of $2,880.00 per annum has been reached. The work demanded is fairly arduous and would appear to demand the whole time of any person holding the position. The qualifications required are high,graduation from a medical college of recognized standing, a license to practise medicine, three years experience in the practice of medicine or two years as a hospital interne; in addition he must have inherent executive ability, tact and good judgment, and possess an excellent physical condition. This competition is restricted to residents of the city of Quebec and a few of the electoral ridings east of it. The *Journal* on behalf of the profession in the Dominion protests against such a small salary for work of such a high character demanding at least 6 years of college training and 2 or 3 years of practical experience.

On the evening of November 7th, Professor Artur Biedl of Prague addressed a representative gathering of physicians and medical students in the medical school of the McGill University. His subject was "Organotherapy." Dr. Biedl differentiated organotherapy from therapy with the chemical compounds isolated from the glands of internal secretion, speaking of it as a special form of protein therapy. Throughout his talk the importance of the inter-relation of the various glands of internal secretion was emphasized, citing as an example how thyroid deficiency causes an upset of the whole endocrine system. For a proper understanding of the endocrine disturbance knowledge of the constitution of the individual is necessary, his somatic and spychic reactions. As the endocrines regulate metabolism so his endocrine formula is his fate. Undoubtedly the endocrine system stands in the first rank as a regulator of basal metabolism, but our standards of normality have not been thoroughly developed. Prof. Biedl cited some of the work in relation to growth and development, stating that the hormone of growth is contained in the anterior lobe of the pituitary. All trials with growth producing substances should be made during one of the periods of normal growth as these are the sensative periods. Premature old age can in some cases be avoided by gonad transplantation. In brief the discovery of insulin was referred to, he terming this as the triumph of organotherapy. Organotherapy is no elixir for every case and an indiscriminate use of organs is to be condemned. Following the formal address Prof. Biedl gave an informal talk upon the practical application of organotherapy citing many examples of successful treatment. The address was enthusiastically received.

Surgeon General Cumming proposes to carry out an investigation of the ordinary respiratory diseases, such as colds, influenza, and similar conditions which are responsible for a great deal of suffering, loss of time, disability, and a not inconsiderable number of deaths. There are few individuals who do not suffer from some acute respiratory condition at least once a year. Some of these attacks develop into serious conditions such as: chronic sinus inflammation, middle ear disease leading to deafness, mastoid disease, and occasionally meningitis. A detailed study of these minor respiratory diseases will be undertaken in an effort to gather morbidity data over a sufficient period of time and a large enough geographical area to render these studies of value in attempting to prevent these affections. To collect these respiratory histories, negative and positive, the co-operation of students has been obtained in Harvard University, Boston, Johns Hopkins Medical School in Baltimore, Georgetown and Howard Universities in Washington, Tulane University in New Orleans, the University of Chicago, and the University of California. It is anticipated that these studies will extend over a period of two or three years, and that the results will give a more definite idea of the epidemiology of respiratory disorders.

Water Poisoning.—The toxicity of pure, fresh, or distilled water for fish, for isolated organs, and for unicellular organisms has been investigated since the time of Paul Bert, who in 1866 ascribed the toxic effect of fresh water on mullet to the difference in osmotic pressure between fresh and sea water causing the tissues to absorb water in excess. A short time ago (June 9th, p. 986) we gave an account of the results of an inquiry by Dr. J. S. Haldane and Mr. K. N. Moss on the effects of high temperature and muscular exertion upon colliers and stokers, from which it appeared that the ingestion of unusual quantities of water might lead to attacks of cramp, spoken of as "miner's cramp" or "stoker's cramp," believed to be due to a form of water poisoning of the muscles brought about by the combination of great loss of chloride by sweating, excessive drinking of water, and temporary paralysis of the renal excretion. Last year Larson, Weir, and Rowntree described a peculiar form of intoxication in patients with diabetes insipidus, who after hypodermic injection of pituitary extract continued to drink the same quantities of water that they had previously been accustomed to take. Within a few hours these patients manifested severe toxic symptoms—headache, nausea, asthenia, incoordination, and staggering gait. After some experiments on animals the authors concluded that this intoxication could not be induced by water alone or by pituitrin alone, but only by a combination of the two. Rowntree has now published the results of a further research on the production of water intoxication in dogs, cats, rabbits, and guinea-pigs without injection of pituitary extract; it therefore appears that pituitary extract favours the occurrence of water intoxication by lessening the rate of excretion and lowering the rate of water exchange, or by facilitating the escape of water from the vascular system into the tissues, but is not an essential factor when the intake of water exceeds the excretory power of the organism. Large quantities (50 c.cm. per kilogram of body weight) were given by a stomach tube every half-hour. In dogs the phenomena were asthenia, restlessness, frequent micturition, nausea, retching, vomiting, salivation, muscular twitching, ataxia, convulsions resembling those of strychnine poisoning, frothing at the mouth, and stupor or coma terminating in death or recovery in a few hours (four to twelve. A subacute form lasting for some days was produced in rabbits by the administration of smaller quantities of water continued over a longer time. Intravenous injection of hypertonic (10 per cent.) salt solution was found to prevent or to remove water intoxication. One experiment on a dog with water intoxication showed that the intracranial pressure was raised, and Rowntree considers it probable that this is, in part at least, responsible for the symptoms, and that the increased intracranial pressure probably depends on a disturbance of the salt to water equilibrium of the central nervous system.—*Brit. Med. Jour.*, Sept. 29, 1923.

Uterine Cancer without Haemorrhage.—J. W. Napjus (*Nederl. Tijdschr. v. Geneesk.*, July 7th, 1923, p. 35) states that the ordinary sequence of events in uterine cancer is leucorrhoea which sooner or later becomes fetid., haemorrhage which is usually irregular and sometimes first appears after coitus, and pain. Undeveloped uterine cancer usually causes no pain, and it is not until the growth has invaded the neighbouring parts that pain is felt. Treub, in his textbook on gynaecology, states that haemorrhage must be regarded as the first sign of cancer of the uterus, and Penzoldt and Stintzing, in their *Handbook of Treatment*, state that haemorrhage after the menopause is almost pathognomonic of uterine cancer. Boersma, in 1918, recorded two cases of extensive cancer of the uterus without haemorrhage, and Napjus now reports the following case. The patient was a woman, aged 52, who had suffered from pain in the left thigh for two months without any relief from salicylates. On vaginal examination a very hard cervix was felt without any haemorrhage after examination, and some tenderness in the left parametrium was detected. Per rectum an extremely tender tumour was found on the posterior wall of the uterus, which was fixed to the pelvis. A diagnosis of inoperable uterine cancer was made and confirmed by a biopsy which showed the appearances of an adenocarcinoma.—*Brit. Med. Jour.*, Aug. 18, 1923.

Men and Books

ABRAHAM GESNER

Abstract from a letter written in 1825 by Dr. Abraham Gesner, a short script of whose life appeared in the October issue of the Journal. The letter was received through the kindness of Dr. D. H. Gesner of Grimsby, Ont.

CORNWALLIS, NOVA SCOTIA,
January 31st, 1825.

Dear Brother:—I have just seen our uncle Abraham on his way to the House of Assembly. He said they all were well. The markets in Halifax are much as usual. Rum, sugar and molasses are very high. The minds of the people remain much in their usual state.

I have been nearly six months studying medicine with Dr. Webster, and am firmly resolved to seek a livelihood as one of the faculty. I have been advised to do so by a number of friends and although the study is one of the greatest magnitude, I am in hopes of going into practice in about two and a half or three years from this time. I have made good progress since I began although I did not think the study so difficult. I am till past midnight often poring over dead men's bones and skulls. This you perhaps would think unpleasant but I have got so used to it that I think nothing about it. The spirit is gone the bones are but dust. I am in hopes to be able to attend a course of lectures in New York. Should this be the case I shall visit you. I shall leave Cornwallis when I go to practice and in this case perhaps pay you a visit. I wish you to make me acquainted with the situation of the country where you reside; the customs of the inhabitants, and let me know whether a medical gentleman would be likely to succeed in that place. Dr. Webster, Jr., has now most of the practice in this place. He furnishes me with books and instructions gratis. Dr. Harding also affords me great assistance. One great reason why young men in this place do not succeed better in business is for want of settled habits of industry. Mankind in general are apt to expect too much of their friends. Friendship hardly extends beyond self interest. Self love is the spring of almost all our actions. It is good to learn wisdom but not good to pay too dear for our schooling. The man whose life is unspotted, and truly seeks that wisdom which is from above and lays his treasures up where moth and rust does not corrupt is the only wise one. He whose closet bears witness to his prayers, his heart to his repentance and the world to his piety and benevolence can only be in the way of the truth.

Your brother,
ABRAHAM.

(*The letter apparently cost 6/7½ in postage. It had no envelope and was addressed to Dr. David Gesner, Orford, Upper Canada. The writing resembles copper plate*).

MAGIC AND MEDICINE

In the *British Medical Journal*, August 23, 1923, Sir Arthur Keith tells us of a chance encounter over an evening meal in a small inn which led to the Mackie Ethnological expedition into Africa, an account of which has just been published in two volumes now issued by the Cambridge Press. John Roscoe, the editor, who had been rector of a country parish in Norfolk, was a modest but industrious student who, seeking for an explanation of the strange behaviour which legend ascribed to the ancient Italian "king of the woods," threaded his way to a great discovery—the discovery that at a certain stage of evolution the conduct of even the highest races of mankind was regulated by magic. Sir Peter Mackie of Glenreasdell was greatly interested in the conversation of this Mr. Roscoe who was the author of *The Golden Bough*. He had read that Dr. Charles Seligman found among the Shilluks of the White Nile that the magic rule of priest kings still existed; so it came about as a result of this after-dinner conversation that Sir Peter Mackie placed a sum at the disposal of the Royal Society and that in the following summer, Canon John Roscoe signed on as supernumerary sailor and set sail for Central Africa. John Roscoe had many qualifications for the work he set out to accomplish. He had spent 25 years of his earlier life in Uganda teaching the natives the ways of Christians and studying closely the beliefs and customs which had hitherto regulated their conduct. For over a year under his contract, Canon Roscoe sojourned amongst the western tribes of Uganda. He is now home and has published the result of his researches. The first volume deals with the dominant people of the province of Bunyoro; the second with those of a neighbouring province. In both cases these ruling people are a pastoral folk, dark as negroes, but with features of the Egyptian type. Amongst these dominant pastoral people our author found all the customs which marked the magic rule of priest kings. Medical men will turn to Canon Roscoe's pages for light on the ancient history of their own profession. They will find that the early practice of medicine was founded on a knowledge of magic. More especially was it based upon an acquaintance with the nature and ways of ghosts. Illness might be caused by a friendly ghost or by one of a malevolent nature; in the one case it had to coaxed out of the patient; in the other it had to be driven out. A belief in magic did not prevent the medical man from applying means which we in the west regard as rational. He applied splints to fractured limbs in the same manner as did the ancient Egyptians. He cauterized open, suppurating wounds; he removed foreign bodies; he applied pressure to stop bleeding; he blistered, purged and gave emetics, and had a wide knowledge of abortifacients. He demanded his fee in advance, for he knew that the death of the patient wiped out his account. The methods of helping the mother when she was in labour are described; after the child was born the mother left the husband for three years, suckling her child for this length of time. At the age of nine years every girl among these pastoral tribes was secluded and embarked upon a process of fattening, for the value of a bride depended upon the response her body makes to this treatment. This explains the figures of very fat women seen in prehistoric drawings found in caves in various parts of Europe. No praise is too high for the author of these volumes; he sacrificed his ease and risked his health and life to save from extinction a large and valued fragment of human experience.

The Bakitara or Banyoro. The first part of the Report of the Mackie Ethnological Expedition to Central Africa. By John Roscoe, M.A., Honorary Canon of Norwich and Rector of Ovington, Norfolk, formerly of the Church Missionary Society. London: Cambridge University Press, 1923. (Demy 8vo. pp. xvi + 370; 42 plates, map and plan. 25s. net).

The Banyankole. The second part of the above report. (Pp. XII + 176; 31 plates and map. 15s. net).

A Casualty Department Forty-five Years Ago.—The Poet Laureate celebrated his 79th birthday in October, and it is forty years since he retired from medical practice and gave up the posts of assistant physician at Great Ormond Street and physician to the Great Northern Hospital. His strictly medical writings have been few; the only one we can trace is a note contributed many years ago on a case of severe rheumatic fever treated with splints. But in 1878 Dr. Robert Bridges wrote a remarkable paper entitled "An account of the casualty department," describing the medical work of the old surgery at St. Bartholomew's where he acted as "filtrator" of out-patients from 9 o'clock till past noon, spending (as he found) on an average a minute and a quarter over each case. Some 158,000 patients were relieved at St. Bartholomew's Hospital in the year 1877. Pondering over this vast number he asked himself several questions, such as, "Where in the world do all these patients come from? What is the matter with them? Have they anything the matter with them? What becomes of them afterwards? Do they ever go there again? How is it possible to attend to them when they do go? How are they counted, sorted, recognized, prescribed for, dispensed for? What quantity and what sort of medicine do they consume? What does it all cost? Who pays for it, and what is the use of it?" The main question, however, to which he applied himself, was: "How can they be attended to?" and his answer gives a vivid picture of the machinery of the old casualty department and its work forty-five years ago. Those who performed the feat each morning of clearing the hall of medical casualty patients consisted of Dr. Bridges and two other casualty physicians, and the junior assistant physician, who each attended four mornings a week. Among the problems of a casualty physician was "to weigh the inconvenience of overcrowding the hospital dispensary against the lesser, or at least less visible, inconvenience of treating a number of different complaints with the same medicine; but what stands most in his way is no doubt his want of time....And yet filter he must, and filter quickly too, and be prepared to hear his quick filtrate shamefully ill spoken of in the wards and in the out-patient rooms.... He will decide at once that what he has to do is the best that can be done for every individual case under the circumstances, and he will make the best of a bad business, and take it patiently." Feeling thus the responsibility and difficulty of the task, Dr. Bridges made a system of hieroglyphic notes for checking off each case as he dismissed it; these records formed the statistical basis of his paper. At that time he saw 7,735 patients in three months, or some 30,000 patients in the year, and of these more than two-thirds were new cases. In the three months nearly 2,000 of his patients took quassia and iron, affectionately known as "Queen Anne" mixture—"a medicine which I selected to give as frequently as possible in consideration of its strong taste, cheapness and innocuous properties." Allowing for the exiguous sum paid to the casualty physician, it appeared that the total cost of his "Queen Anne" patients was well under twopence a head. Dr. Bridges found that in the year he took book-notes of only 70 cases, and reflected on how much rich material for study was daily thrown away. The congested casualty department in his time supplied less than a quarter of the cases in the wards, and he came to the conclusion that the serious cases bore no relation to the trifling ones, and that the former would come in just as great numbers were the latter discouraged. While agreeing that the mistakes were very rare and the treatment fairly satisfactory, he maintained that the system was intolerable and must be reformed. How far reform has gone in forty-five years might be a congenial subject for inquiry by one of our younger medical poets. Great changes were made for the better when the new casualty and out-patient department of St. Bartholomew's was opened in 1907. —*Brit. Med. Jour.*

Famine and Pestilence in Russia.—In a recent pamphlet Dr. P. Mühlens, bacteriologist of the Tropical Institute at Hamburg, gives an account of the conditions he met with in Russia when as director of the German Red Cross Expedition he visited that country in September, 1921. There appears to be little doubt that the extent of the famine and epidemic disease which devastated Russia in the years 1921 and 1922 was unparalleled in the modern history of Europe, although periods of starvation followed by pestilence have been frequent in Russia since the earliest times. As the result of the failure of the harvest in 1921 it was estimated that by April, 1922, the number of starving persons in Russia, including the Ukraine, was 40 millions. The mortality was highest among children; the death rate in the first year of life was put at 80 to 100 per cent., and in older children at 30 to 40 per cent. Substitutes for bread were made from bark, acorns, grass, straw, and even clay. Numerous cases of coprophagia were reported, particularly among children. Well authenticated instances of necrophagia and cannibalism occurred, as in previous periods of the history of Russia, especially in the famine years of 1230-31 and 1601-2. The diseases following in the train of famine were hunger, oedema, scurvy, noma, intestinal diseases, dysentery, enteric, and, most important of all, typhus and relapsing fever. The last two diseases were spread in the crowded railway carriages and waiting rooms, and homes and camps for refugees, whose lousiness beggared all description, as well as in common lodging houses in the large towns, and also in the hospitals. Whole families fell ill during the railway journey and many died in the carriages or on their arrival. Owing to the disorganization of the sanitary service the number of notifications did not represent the actual number of cases, but in the Ukraine alone it was estimated that during the first four months of 1922 there were 137,083 cases of typhus, 53,578 of relapsing fever, and 42,388 of enteric. In 1921 alone there were 176,886 cases of cholera in Russia, as compared with not more than 50,000 cases during the whole course of the war. No reliable statistics were available concerning malaria. Owing to the exhaustion of the population by famine and disease the carrying out of effective sanitary measures was practically impossible; but Dr. Mühlens pays a high tribute to the Russian medical practitioners and men of science, who, with the most primitive equipment and in unheated laboratories and often without gas or electricity, were able to carry on work of the highest order.—*Brit. Med. Ass. Jour.*, Aug. 18, 1923.

Correspondence

CIVIL SERVICE COMMISSION SALARIES

Dear Editor:—A notice from the Civil Service Commission, mentions a vacancy for assistant librarian at a salary of $3,600. It seems most inconsistent that this Commission values the position of an assistant librarian much more than that of a quarantine officer at one of our ports of entry into Canada. I wrote to Dr. Routley regarding the very low salaries that they were offering quarantine officers and the high qualifications they were required to possess. I should think that the qualifications of a man who guards the health of the people against contagious diseases from foreign countries should be worth more than the qualifications of an assistant librarian.

Yours truly,

Arthur Wilson,

Medical Health Officer.

Saskatoon, Nov. 7, 1923.

Medical Societies

THE INTERNATIONAL CONGRESS OF SURGEONS—DISCUSSION ON THE SURGERY OF THE ENDOCRINE GLANDS

Surgery of the endocrine glands was the first subject discussed at the sixth triennial meeting of the International Congress of Surgeons in London this year. Dr. Veau of Paris, discussed the surgery of the thymus in early infancy, pointing out the three types of surgical intervention practised in hypertrophy of the gland. Fixation had been unsatisfactory. Resection of the manubrium without thymectomy he did not consider justified. Subcapsular thymectomy was, in his opinion, the only routine operation to be performed. It was not difficult and had good results. That the mortality was as high as thirty per cent. was largely due to associated conditions, which should be taken account of before operating. Ablation of the gland did not interfere with growth, for only the superior poles were removed.

Radiotherapy was another therapeutic measure of great value, but was not without its dangers. Occasionally symptoms suggesting infantile cholera developed; also, signs of a mild meningitis.

Dr. Lorthioir of Brussels pointed out that the functions of the gland were obscure, but its ablation could be compared with the removal of adenoids, and, he thought, in time, would be practised as frequently.

Dr. W. J. Mayo discussed the splenic syndrome. He referred to its functions in the removal of degenerated red cells and toxic agents from the blood, and also in the formation of white cells. The normal spleen appears unimportant in function (sic) but the diseased spleen was a serious menace to the constituents of the blood, and to the liver. Its removal in splenomegaly and certain blood diseases removed a pathological agent. A chronically enlarged spleen which did not yield to medical treatment should be removed early, except where contra-indications existed.

He summarized the number of splenectomies performed in the Mayo Clinic up to June 1st, 1923, a total of 304. The two largest groups were under the headings of pernicious anaemia and splenomyelogenous leukaemia. Of the former there were 57 cases with three deaths in hospital and no deaths among the last 38 prepared by blood transfusion. Over ten per cent. of the cases lived more than five years after splenectomy, and over 22 per cent. more than three years. There were no cures, but the abnormal blood picture was improved. But splenectomy in this condition is justified in only a limited number of carefully selected cases.

Twenty-nine cases were operated on for splenomyelogenous leukaemia. One died in hospital; there was great temporary benefit in twenty-eight. Six were alive and able to work, one more than six years after operation. The condition of the blood was improved but it did not return to normal.

Other conditions for which splenectomy was performed were, enlargement due to micro-organisms, syphilis, tuberculosis and the pyogenic organisms; Banti's disease; haemolytic icterus; haemorrhagic purpura; erythraemia. There were also 61 miscellaneous cases.

Surgery of the pituitary body was discussed by Mr. Percy Sargent. What might one expect from operating? Would it alter the secretion of the gland and relieve symptoms due to a disordered metabolism. Was the gland enlarged to the extent of causing pressure symptoms on neighbouring parts, especially the optic nerves and chiasma; or were there symptoms of increased intracranial pressure? He was trying to pass on the lessons learnt from his own experience. More could be done by relieving local pressure, than by trying to alter the disturbed pituitary function. But removal, which meant partial removal, helped the symptoms, such as visual deterioration and headache. In his opinion, there were a number of causes for the failures, *e.g.*, errors of diagnosis; massive intracranial extension of the tumour, in which an operation could do no more than give palliative decompression; post-operative pituitary toxaemia; in the case of trans-sphenoidal route, sepsis. He advocated the frontal approach to the gland.

The Value of Drugs of the Morphine Group in Relieving Cough.—P. Hecht (Klinische *Wochenschrift*, June 4th, 1923, p. 1069) records the results of clinical observations which he has made in order to determine the value of various derivatives of the morphine group in relieving cough. Codeine is more satisfactory than morphine for the relief of cough, since it is not generally narcotic in its action and does not lead to the formation of a drug habit. It is the most useful of all drugs for the relief of cough and does not produce bad after effects. Severe paroxysms of coughing are often arrested by a sufficiently large dose of codeine (0.05 gram), and the drug can be discontinued without difficulty. The author has tried to find a more powerful and cheaper substitute for codeine. He describes the precautions necessary in testing clinically the value of drugs for relieving cough, and the class of cases most suitable for observation. Paracodeine and dionin were found to be less effective than codeine. But from his observations the author considers that "dicodid" is at least as effective as codeine and is more effective than paracodeine and pantopon. It is preferred by the patients and produces a definite feeling of well-being; but in time a drug habit is formed and there is difficulty in getting the patient to return to the use of codeine.

A Side Light from the Source on Osteopathy.—In 1874, Andrew T. Still founded osteopathy. He tells about it in his autobiography. He tried to get started in Kansas, but the powers at Baldwin University refused to permit him to expound his doctrines at that institution. In May, 1875, he was in Kirksville, Mo. It appears that he rather anticipated having a hard time, and he tells that his wife promised to stand by him and help him fight his battle. At this point in his story he presents a little incident which we have thought worth quoting:

I did not tell her (his wife) that when I came to Missouri I found a letter addressed to my brother Edward, from brother Rev. James M. Still, of Eudora, Kans., stating that I was crazy, had lost my mind and supply of truth-loving manhood. I read it and thought, as the eagle stirreth up her nest, so stir away, Jim, till your head lets down some of the milk of reason into some of the starved lobes of your brain. I believed Jim's brain would ripen in time, so I let him pray, until at the end of eighteen years he said:

"Hallelujah, Drew, you are right; *there is money in it*, and I want to study 'Osteopathy.' "

We acknowledge that we are responsible for the italics.—*Jour. A. M. A.*, Sept. 29, 1923.

Abstracts from Current Literature

MEDICINE

Physiology of the Extrahepatic Biliary System and its Application to Surgical Therapy. Heyd, C. G. *A.J.M.S.*, October, 1923.

The writer reminds us of the common embryological origin of the stomach, duodenum, liver, biliary system and pancreas. Of the two main functions carried out by the stomach, i.e., secretion and motion, the latter is by far the most important, and is performed in a definitely rhythmical manner. This depends on a neuromuscular mechanism which acts in accordance with the so-called law of the intestine. By this is understood the fact that local stimulation of any segment of the intestinal tube causes a contraction above and a relaxation below the stimulated part. It has also been shown that whenever there is an irritation of the gut tube, an exaggeration of function is soon established in the region above the point of irritation. Any disturbance in the physiology of the external biliary system must be considered with these facts in view.

The conditions under which the bile is secreted and delivered into the duodenum call for some expulsory effort on the part of the muscular elements of the gallbladder, and, for what is equally necessary, a relaxation of the lower part of the common duct, to allow of ejection of the bile into the duodenum. From the neuromuscular point of view, the muscle fibres of the gallbladder and the sphincter of Oddi at the ampulla of Vater, are antagonistic in action.

There are three factors in the delivery of the bile into the duodenum, (a) hepatic secretory pressure, (b) expulsive power of the gallbladder, (c) the action of respiration; but all three are insufficent without the relaxation of the sphincter of Oddi. He dwells on the emptying of the gallbladder as due to overdistension and this sets up the reciprocal half of the reaction. In cholecystectomized animals the delivery is continuous, as there is a loss of the upper half of the mechanism, and the sphincter ceases to function. But in man, after such an operation, the upper part of the common bile duct dilates into an artificial gallbladder, and eventually the mechanism is restored.

In discussing infections of the biliary system, he concludes, after comparing the four possible channels of infection, that the commonest path is direct infection of the walls of the gallbladder from an infected liver. Infection comes up by the portal vein, involves the periportal tissues and induces an infective process that eventually reaches the gallbladder. This would explain the frequent association of cholecystitis with appendicitis, peptic ulcer, typhoid fever, haemorrhoids, etc.

He concludes that ablation of the gallbladder does not affect the individual, and, as the infection is usually in the wall, removal is the only plan. Certain points are mentioned in the differentiation of the diseased gallbladder from one with stones, *e.g.*, thickening of the walls; presence of saffron-coloured fat up on to the fundus; hyperplasia of nodes in the neighbourhood; papillomatous-like lining membrane. He is inclined to discount adhesions as a sign of inflammation of the bladder. H. E M.

Antipneumococcic Serum in Lobar Pneumonia; A Clinical Report. Camac, C. N. B. *Amer. Jour. of Med. Sci.*, October, 1923.

Much value is to be derived from the continual comparison of work, and the writer of this paper looks forward to the publication of results obtained by other workers, in connection with the treatment of lobar pneumonia His report relates to the serum treatment of this disease in the wards of the Gouverneur Hospital. It covers a period of five years, with a break of two and a half years due to war conditions; but a certain number of military cases are included, which were treated during this period.

In his opinion, there is apt to be a waste of valuable time in diagnosing the type of pneumococcal infection. Many hospitals are not in a position to perform the differential typing as a routine, and until this can be done he thinks that it is well worth while treating all cases of pneumonia with serum before or even without the differentiation; the administration of the antipneumococcic serum is indicated just as urgently as is the use of antimeningococcic serum where there is meningeal involvement.

At the beginning of his series Type 1 serum only was used, all other types being untreated with serum; this was in accordance with the instructions in the Rockefeller monograph. Later on, as valuable time was lost in waiting for reports, the serum was given in all instances, and in the military cases all were so treated. It was the favourable experience with the latter that led him to adopt the use of polyvalent serum in the Gouverneur Hospital after the war. He admits that laboratory conclusions do not support the use of this particular serum in cases other than Type 1 pneumonia, but his clinical experience, in his opinion, fully warrants the giving of it in all cases.

The total number of all types of lobar pneumonia included in the series was 603. Serum was used in 244 cases, and the mortality was 13.9%. There were 359 not treated with serum, and the mortality in this number was 29.8%. The serum is most valuable in the first twenty-four or thirty-six hours, a point well illustrated in the military cases, who were all treated not later than the second day.

Cases were desensitized by the subcutaneous method, using two, three and five c.cm. at one or two-hour intervals. The usual quantity of serum given was 100 c.c.m., and it was only occasionally necessary to repeat this more than three times at twelve or twenty-four hour intervals. There were two cases of anaphylactic shock, neither of whom showed hypersensitiveness by the subcutaneous administration; in one of them there was a history of asthma. In such cases adrenalin should be given and the serum discontinued at once. H. E. M.

PAEDIATRICS

Gastric Lavage in Vomiting of Infants. Jackson, H. F. M.D., *Arch. Paediatrics*, Sept., 1923.

Nineteen different feeding cases with vomiting as the predominant symptom, were treated by lavage and often without change in the feeding. These infants were usually emaciated, fretful and constipated, but presented no signs of obstruction or rumination. When the tube is passed into the stomach a quantity of thick mucus is obtained, often with considerable gas. Thus the underlying condition appears to be a sub-acute or chronic gastritis.

A No. 18 or 20 French catheter attached to a rubber tube and funnel is readily passed into the stomach and from one to one and a half pints of a warm four per cent. bicarbonate of soda solution is run in and out until the return is clear. Improvement is immediate and the vomiting usually ceases after one or two washings. Lavage may have to be repeated once, every day or two, for a short time. An average gain of one and three-quarter pounds within a month is recorded for the nineteen cases. L. M. Lindsay

Constipation in Infants. Guilee, C. G., M.D. *Lancet*, June 15th, 1923.

True constipation results when the bowel content is too dry or the musculature of the bowel is inefficient. Sluggishness in breast-fed infants is usually caused by the early use of cathartics. Castor oil should not be given to new-born infants—a suppository is more effective. A day or two without a stool will do no harm provided there is no colic or accumulation of gas.

In the artificially fed infant true constipation results from feeding too much fat, which combines with calcium to form calcium soaps. To correct this the fats should be more or less replaced by an equivalent amount of carbohydrate. A mixture of carbohydrates is desirable such as Dextri-Maltose, Horlick's Food, Mellen's Food, Liquid Malt Extract, etc. Of the starches the most laxative is oatmeal, which may be combined with one or more of the above mentioned sugars.

Finally, it may be necessary to use a suppository which should be employed at the same time each day to form a regular habit. Cathartics tend to reproduce the trouble. L. M. Lindsay

OTO-LARYNGOLOGY

Postoperative Lung Complications. Herb. Isabella C., M.D., Chicago. *A.M.A. Jour.*, July 29th, 1922. LXXIX, No. 5.

This article deals with lung complications following general surgical operations. A series of 107 cases is discussed; four of them were lung abscess; two followed tonsillectomies, in one of which a piece of tonsillar tissue had been aspirated. However, in a series of 12,045 tonsil and adenoid operations, there were only four lung complications, two were abscess and two pneumonia. Regarding preventative treatment, stress is laid on the careful administration of the anaesthetic, with as small a concentration of the vapour as possible. The second point suggested, is the washing of the mouth and throat with an antiseptic previous to operation. P. G. Goldsmilh

Studies of Bacillus Fusiformis and Vincent's Spirochete. Davis, D. J., M.D., and Pilot, Isadore, M.D., Chicago. *Jour. A.M.A.*, LXXIX, No. 12.

The discussion is for the purpose of proving that many infections about the mouth and ears which are of a putrid and gangrenous character, are due to these organisms. Their most common habitat is in actinomyces-like granules found in tonsillar crypts. A brief description is given of these granules with a photograph. The question of prophylaxis is taken up, which consists in keeping the mouth clean and the general condition good. Treatment with arsphenamine has given encouraging results. P. G. Goldsmith

Observation on the Results of Roentgen Therapy in Chronic Tonsillitis. Babcock, James W., M.D., New York. *Jour. A.M.A.*, February 3rd, 1923, LXXX, No. 5.

A summary of the results observed in a series of cases so treated occurring in the practice of Dr. C. G. Coakley and the author, forms the basis of this very timely and instructive paper. The enthusiastic claims of some advocates of this method of treating chronic inflammation of lymphoid tissue, particularly the tonsils, has been very thoroughly examined. Dr. Witherbee's claims are set forth in detail and these have been refuted by the author's clinical observations, and further confirmed by pathological and bacteriological studies made chiefly at Columbia University. Lederer's paper on the Roentgen Ray in Tonsillar disease (*Jour. A.M.A.*, 79; 1130, Sept. 30th, 1922) is quoted in confirmation.

The author's observations lead to the conclusion that though Roentgen therapy, as now advocated, may cause more or less diminution in the size of tonsils or other lymphoid tissue in the pharynx or naso-pharynx, the residue has been observed acutely inflamed, and much increased in size while inflamed. It has been demonstrated that the small fibrous tonsil is liable to serve as a focus of infection with remote symptoms. The observations on tonsils excised indicate that they are not made free of pathogenic bacteria; there is no evident increase in connective tissue, diminution of lymphoid tissue, lack of activity of the germinal centres or widening of the crypts. Neither the adenoids nor the hypertrophic lymph nodules on the posterior wall of the pharynx disappear, nor do they change in any appreciable way; they are subject to occasional inflammations similar to those preceding Roentgen therapy. General symptoms, involving the heart and joints, have not been relieved in these cases by Roentgen therapy, and, in some of the cases, have improved following an operation some time after the Roentgen therapy.

Case histories and findings are summarized, to support these observations, and attention is directed to the liability of undue enthusiasm about any therapeutic measure as likely to cause injury to those it is designed to benefit, either directly or by supplanting more effective measures. Until it is more definitely shown that diseased tonsils and other lymphoid tissue in the pharynx and naso-pharynx can be eradicated as efficiently by the less unpleasant process, reliance must be placed on surgery. P. G. Goldsmith

Seasonal Hay Fever. Black, J. H., M.D., and Annette Black, Dallas, Texas. *Jour. A.M.A.*, December 23rd, 1922, LXXIX, No. 26

In this article the treatment of hay fever in Texas is discussed. Most of the series of 100 cases were of the autumnal variety and were treated with ragweed pollen. The authors claim no complete cures but got various degrees of improvement in all. The intradermal injection of the pollen is advised. In testing they state that only twelve out of ninety cases had escaped intranasal operation, but in no case was the hay fever benefitted. P. G. Goldsmith

SURGERY

Cancer of the Prostate. A comparison of results obtained by radium and surgical treatment. Bumpus, Hermon C., Jr. *Surg. Gyn. and Obstrs.*, August, 1922, XXXV, p. 177.

There are many considerations, which render comparisons between the results of the treatment of prostatic cancer by surgical procedure and radium therapy very difficult. As a general rule, only favourable cases are submitted to operation, whereas radium therapy has been employed where the general condition of the patient, or the extent of the disease would not permit of surgical intervention. Many of these latter cases have been so far advanced, or in such poor physical condition, that death was inevitable, the treatment with radium only resulting in placing an unmerited stigma upon it. Moreover, radium therapy has only been practised since 1915, and in its earliest stages was largely experimental. This fact prevents a just comparison between the results in patients treated surgically and those treated by radium.

The results obtained by the Mayo Clinic in the treatment of 276 patients, 124 by partial prostatectomy and 152 by radium, have been carefully studied and afford interesting conclusions.

The mode of operation, perineal or suprapubic does not seem to be a factor, although slightly better results have followed the suprapubic approach. Neither is the degree of malignancy, up to the limit of operability, a determining factor. Much more important in the prognosis is the histologic type of the growth, as determined by microscopic examination. In 241 cases of prostatic cancer examined at the Mayo Clinic and not treated, the average duration of the disease was thirty-two months from the first symptoms to death. In the surgical group, duration of the disease averaged fifty-seven months. Comparison in this respect with radium would be misleading, owing to treatments being more recent. Considering the patients who have died, those treated by surgery survive, on the average, about ten months longer than those treated by radium. Twice as many surgical patients are alive at the end of a given year after operation than radium patients, and twice as many of the radium group are alive as of the untreated group. The results show the possibility of removing the cancerous process in its entirety, as nine per cent. of the surgical patients are still alive at the end of nine years.

The author is of the opinion that surgery alone gives better results than radium alone. In the future, with improvement in radium technique, the results should be identical. The best results will follow a combination of the two methods of treatment. When used together, the radium should be applied before surgery. F.S.Patch

The Relation of Lesions of the Transverse Processes to Pain in the Back and Legs.

Bauman, Geo. I., Cleveland, Ohio. *Journ. of Bone and Joint Surg.*, July, 1923. V. No. 3, p. 579.

The possibility of anomalies of, or injuries to, the lumbar transverse process should be considered in cases of lumbosacral pain, and in cases of referred leg or hip pain, with or without history of injury. These processes show a wide variation in length, shape and direction, and may be a source of pressure upon the lumbar nerves, which cross immediately in front of the lower four. Nerve irritation may be expressed by pain, numbness or paresis, a sciatic pain being the commonest type.

The most definite sign that the transverse process is at fault is the presence of tenderness over its tip, especially when pressure here causes a reproduction of the pain complained of in back or leg. The fifth transverse process is the most frequent offender and may even cause pain by impinging against the ilium. Lesions found at operation to remove the offending process were elongation of the process, old fracture with angulation, congenital irregularity, and enlargement (sacralization) of the process, (especially the fifth), presence of a fibrous band beneath the process and pressing upon the nerve trunk, pressure of a bony mass attached to the process, either due to old fracture or congenital anomaly. It is to be noticed that transverse processes are excised by the writer with relief of pain in the presence of normal X-ray findings, if there exists tenderness over the tip of the bone. A typical history is one of a strained back with pain persisting on lifting. Manipulations, plaster jacket and treatment of a possible source of infection having failed to relieve, the transverse process is removed. The operative approach is by incision about two inches from midline, going through the fibres of the erector spinae by blunt dissection. The process is bared and removed by chisel and mallet, care being taken of the underlying nerve cord. In the case of a large fifth lumbar transverse process a portion of the posterior extremity of the iliac crest may need removal to expose the low lying fifth process. It is to be noted that good X-rays failed at times to demonstrate a lesion, usually an old fracture, of the processes. J. A. Nutter

Synovectomy in Chronic Infectious Arthritis.

Swett, P. P. *Journ. of Bone and Joint Surg.*, January, 1923, V. No. 1, p. 110.

Description is given of an operation to remove the diseased synovial membrane in cases of infectious arthritis where all other curative means including removal of infective foci have failed. It is thought that by doing so one can (1) remove the organized exudate (2) remove secondary foci of infection contained in the exudate, (3) promote metabolism. It is to be noticed that the one case which showed ulceration of the joint cartilage failed. It is of interest also to note that in only one case did the removed diseased synovial membrane show micro-organisms. The results have been good, often a complete return of function in joints (usually knees) apparently hopelessly involved. The dissection is carried out by scissors and forceps, and the operative reaction has been slight. The joints have been closed without drainage and no fixation has been employed. The cases were almost all of long standing, showing marked joint effusion, capsular thickening and fusiform swellings. The synovial membrane was thickened and dense and the organized exudate showed either as villous tags or fringes; as a pannus extending over the articular surfaces; or as a dense tough membrane walling off the capsule into compartments. Synovectomy is to be done while the disease is confined to the capsule and synovial membrane before any damage has been done to joint cartilages. After reporting a number of surprisingly good results the writer closes by saying that synovectomy is a procedure which warrants further consideration in cases of chronic infectious arthritis. It is to be noted that the writer follows the Goldthwaite classification of arthritides, and in this paper makes no reference to the chronic hypertrophic or atrophic types. His cases belong wholly to the chronic infectious type, attributable to teeth, tonsils, urethra, etc. J. A. NUTTER

Collateral Circulation in Chronic Obstruction of the Pulmonary Veins, and its Relation to Air Embolism Following Various Diagnostic and Therapeutic Procedures (Pneumolysis).

Schlaepfer, K. *Surg. Gyn. and Obst.*, October, 1923, XXXVII, p. 510.

Experiments on dogs demonstrate the formation of collaterals between the pulmonary and systemic circulation consequent on the chronic stasis following partial occlusion of the pulmonary veins in one lung. This serves as an explanation for certain pathological processes governing the changes in chronic inflammatory conditions with obstruction of the pulmonary veins in one lung in man. The formation of new collaterals to the veins of the upper thoracic aperture is of the greatest clinical importance. With these facts in mind special attention is indicated in chronic lung tuberculosis when performing a puncture for diagnostic or therapeutic purposes. When breaking up adhesions in the wall of a partial pneumothorax during operations, such as pneumolysis, pneumotomy, and pneumectomy, we have always to face the possibility of the existence of these collaterals as a complicating factor. The main danger in these operations is air embolism through the pulmonary veins into the left heart. The surgeon should attempt to prevent air embolism by taking special precautions when working in those parts of the lung adherent to the chest wall or mediastinum.

When confronted with an air embolus, stop the operation immediately; pack the wound thoroughly; lower the head and thorax (Trendelenburg position) so that the place of injury is situated below the level of the heart. This diminishes at the same time the danger of an air embolus into the brain. Stimulants may be used to strengthen and reinforce the heart action. Puncture of the right auricle and aspiration of the air, as advised by Delore, will prove very efficacious. FRASER B. GURD

Empyema Necessitatis.

Tees, F. J. Arch. of Surg., September, 1923, VII, p. 321.

In this article the author reviews the routes which are likely to be followed by pus accumulating in the chest cavity if not surgically drained. He points out that possibly encapsulation and absorption of the products of inflammation may occur. Pus may perforate the parietal pleura at one or more points. It may cause ulceration of the skin and spontaneous evacuation; at other times denudation of the periosteum or perichondrium may occur before the pus reaches the surface. Sometimes the pus may burrow for some distance in the muscles.

Perforations most frequently occur in the parasternal line where the chest wall is thinnest; the intercostal spaces lack the support of the intercostal muscles and corresponding gaps are left between the digitations of the deeply placed sterni muscles.

The author states that, while it is conceivable that pus from an empyema might pass down the spine and along the psoas into the iliac fossa, a lumbar abscess could not be formed in this way. Such descriptions are found in many text books, serving to show how a minor inaccuracy may become firmly established. What undoubtedly happens when the abscess appears in the loin is, that the pus has burrowed behind the external arcuate ligament of the diaphragm to invade the quadratus lumborum muscle, the sheath of which is quite distinct from the psoas.

Cases illustrating such tracking, and the presentation of anatomical dissections make clear the route followed in basal empyema pointing in the loin. FRASER B. GURD

Obituary

DR. ALEXANDER ESSELMONT GARROW

On the morning of November 7th, Dr. Alexander Esselmont Garrow "obeyed the summons that brooks no refusal" and at his residence, 289 Mountain St., Montreal, passed to the peace and quiet of an eternal rest. Dr. Garrow was born in Scotland in 1862. His preliminary education was obtained at the Grammar School in Aberdeen. Coming out to Canada in 1872 with his parents, he attended the Ottawa High School and afterwards spent a year at the Model Training School for Teachers. On graduating he taught in Ontario for five and a half years.

Dr. Garrow began the study of medicine at McGill University in 1885. As a student he was recognized by his fellows as a man of ability and strong personality. He achieved many distinctions during his course and graduated with the highest honours of his year in 1889, winning the Holmes Gold Medal.

For the following five years he practised his profession at Ottawa, and in 1895 he was chosen by Sir Thomas Roddick, then Dean, for the position of Assistant Surgeon to the Royal Victoria Hospital and was at the same time appointed Lecturer in Surgery and Clinical Surgery at McGill University. He became Assistant Professor in 1908. On different occasions he visited Great Britain and the Continent for post graduate study. He wrote a number of articles on surgical topics. He was a past president of the Montreal Medico Chirurgical Society and a Fellow of the American College of Surgeons.

DR. ALEXANDER ESSELMONT GARROW

Through the death of Dr. Garrow a great figure has passed away; his loss will be mourned not only in Montreal, but throughout the whole country. Behind him he leaves the kindly memories of pleasant associations and the record of an upright, earnest and blameness life. His abounding energy and industry made possible for him one of the fullest lives of his time. His powers of application were remarkable and in his life he exemplified the nobleness of toil. He delighted in work for its own sake rather than for any monetary reward it might bring. His patients loved him for his tender care and unselfish devotion, and many were his "Little, nameless, unremembered acts of kindness and of love." Dr. Garrow was a doctor's doctor and gave without stint services to his colleagues and their families. As a consultant he brought to the bedside a huge fund of knowledge and experience. Careful and accurate in diagnosis; a skillful operator, cool, courageous and resourceful in emergency, he ranked as one of the leading surgeons of the Dominion. His technique was exceedingly thorough and his operative results good. He was wisely conservative and safe, and kept in close touch with the developments of surgery.

The stress and strain of thirty-four years' hard work told heavily upon him. During the past two or three years many unmistakable warnings of cardiac failure appeared but he kept at his work with vigour unabated until a few weeks before his death. He "died in harness" as he would have wished.

The sadness is that the end came much too soon. His large funeral was a striking tribute to the esteem in which he was held. He leaves a widow and a son and daughter to whom we extend our heartfelt sympathy.

W. GRANT STEWART

Dr. Richard Eden Walker, one of the best known and deeply respected members of the profession passed away on August 27, 1923, at New Westminster, B.C. Dr. Walker was a quiet man of a retiring nature and a disposition essentially kindly. His reputation was province-wide, and no man held more the respect and affection of those who knew him. He was the type of citizen a country can ill afford to lose. President of the B. C. Medical Association for 1922-23; a member of the Council of the College of Physicians and Surgeons of B. C. for 22 years, having on several occasions occupied the president's chair; he represented this province on the Canadian Medical Council ever since its creation and was its President during 1921-22. He was a man of fine character, exceptional ability and applied in his practice the best that is known in our art. He had a wide experience in all matters affecting the profession and possessed to a remarkable degree a singularly sane judgment which rendered his opinion of real value. He passed away quite suddenly without any sadness of farewell, but he has left behind in our minds and hearts, a very grateful and appreciative memory.

Dr. Thomas W. Jeffs, coroner for Vancouver, B.C., died at the Vancouver General Hospital, October 6th, 1923, in his 66th year, following an operation for a chronic trouble . The news came as a shock to a large number of friends, as Dr. Jeffs was a general favourite in many circles. He was educated at Toronto University, and before coming west in 1890 practised in Apsley, Ontario. He was prominent in Orange circles in British Columbia, attaining the highest office of that organization in the province. In 1906 Dr. Jeffs occupied a seat in the city council as alderman and was a police commissioner in 1907. He married Miss Minnie Cowan and they had a family of two sons and one daughter. As a coroner Dr. Jeffs was distinguished for his outspoken manner when he thought the case deserved it, and at all times for his commonsense instructions to juries. He was zealous of the reputation of his court for impartiality and the proceedings were always conducted in a manner that gave every opportunity to persons under suspicion to clear their names, while at the same time no obstruction was thrown in the way of the police and witnesses to bring out all the evidence.

Dr. Charles Henry Morris, one of the oldest practitioners of Nova Scotia, died at his home in Middle Musquodoboit on the ninth of October. Dr. Morris graduated at Harvard in 1868, and continued in active practice until within a few months of his death. One of the most companionable of men, possessed of a keen sense of humour, kindly and sympathetic, an earnest student and a good observer, prompt in responding to every call, Dr. Morris enjoyed the confidence, respect and affection of a very large circle of friends both within and without the profession. He was thoroughly imbued with the traditions of "the old school," and consistently placed service above self. Long years of a very exacting country practice did not lessen his enthusiasm and love for his profession, so it was not surprising that there was "mourning in the glen" quite comparable to that described by Ian MacLaren, when the good doctor fell victim to the enemy from which he had so faithfully and so successfully protected his fellows for more than half a century.

Dr. J. E. Montgomery, after a week's illness, passed away at Ladysmith, Vancouver Island, on Tuesday, November 6th. He contracted diphtheria which soon developed into a virulent laryngeal form and in spite of all efforts to save his life his condition rapidly grew worse. Dr. Montgomery graduated from Toronto University in 1910, and received post-graduate courses in Toronto, Chicago and New York. He then served for a time as medical officer on the *Empress of Japan* in the Pacific. Later he practised on Vancouver Island. During the Great War he served for three years with the Canadian Expeditionary Force in France. He was a member of the 13th Field Ambulance Corps. After the war he was appointed medical officer for the employees of the Canadian Collieries Ltd., at Ladysmith, where he lived for the last five years.

Dr. Thomas Phillips, died in Toronto on November the 2nd, aged 90 years. One of the oldest Canadian graduates, Dr. Phillips had been actively concerned in much that was interesting in Canadian medicine. He entered Trinity in 1856, but did not graduate from that institution as a religious test was applied to all intending graduates at that time. Securing his degree from the old Toronto School of Medicine, he practiced for 25 years in Grahamsville, and during that time acted as surgeon of the Peel Regiment during the Fenian Raid. In 1880 he went to Winnipeg, where he became Medical Health Officer, and later on one of the aldermen of the city. He subsequently came to Toronto and practiced there until he retired some time ago.

Dr. Charles Edward MacMillan, a Dalhousie graduate of 1899, died at Inverness on the 26th of October. For some years he represented Inverness County in the Nova Scotia Legislature, and in several ways identified himself with public affairs. He had been in poor health for a long period before his death.

Dr. C. L. Ogden, a graduate of McGill University died in New York, October 20th, at the age of 56 years. For many years he has practiced his profession in Cambridge, Mass.

Major Dr. Norman Grace, died in Renfrew on October the 21st, aged 30 years.

Dr. Lavern Lawranson, died in West Toronto on November 4th, aged 53 years.

Pyelitis of Pregnancy.—A series of twenty-five cases of pyelitis of pregnancy are analyzed by Herman L. Kretschmer, Chicago. In twenty of these twenty-five cases, colon bacilli were obtained on culture; in seventeen, only colon bacilli; in three, only staphylococci; in one, only streptococci; in one, only diphtheroids, and in three, colon bacilli and staphylococci. A careful review of the bacteriologic findings gave: bilateral cases, twenty; right side only, five; left side only, none. Leukocyte counts were recorded in nearly all the cases. The highest figure recorded was 30,200; the lowest during the attack was 7,600. The largest number of cases of pyelitis of pregnancy can be handled in a conservative way. In cases that fail to respond to this treatment and in which the patient's condition is such as to demand treatment, pelvic lavage with silver nitrate, with or without ureteral catheter drainage, is the most rational and logical as well as the safest and most successful form of treatment. Failure of this form of treatment, after a thorough trial, probably calls for a rapid termination of the pregnancy. Surgical procedures on the kidneys, such as nephrotomy or nephrectomy, are not justified in pyelitis of pregnancy —*Jour. Am. Med. Ass.*, Nov. 10, 1923.

News Items

GENERAL

BANQUET GIVEN BY THE GOVERNORS OF THE UNIVERSITY OF TORONTO TO PROFESSOR F. G. BANTING, M.C., M.D., D.Sc., LL.D., AND PROFESSOR J. J. R. MACLEOD, M.D., D.Sc., F.R.C.S. F.R.S.

At a special convocation of Toronto University held November 26th, 1923, Chancellor Sir Edmund Walker presiding, the Honorary Degree of Doctor of Science was conferred upon Professors F. G. Banting and J. J. R. Macleod. The candidates were presented by the President Sir Robert Falconer in well chosen words, concisely setting forth the claims of each to the distinction conferred.

In the evening the Governors of the University gave a banquet in their honour, and to celebrate the award to them of the Nobel prize. The function was held in the Hall of Hart House and was attended by some four hundred graduates of the University and representatives of various public bodies. The Honorable Mr. Cody acted as Chairman, and among those at the head table were the Chancellor, Sir Edmund Walker, Sir William Mulock; the President, Sir Robert Falconer; Prof. L. Barker of Johns Hopkins, Prof. A. B. MacCallum of McGill, General Fotheringham; Mr. W. J. Nickel, the Attorney General of the Province of Ontario; the two guests of honour, and Mr. Best. The chairman in an excellent speech reviewed the foundation of the Nobel prize fund, its objects, its restrictions, by whom it had been won. The name of Banting and Macleod would henceforth be enshrined with those of Koch, Behring, Pasteur and Lister.

Sir Edmund Walker outlined the plan adopted by the University to ensure to the fullest extent that the benefits of insulin should accrue to the afflicted diabetics throughout the world and that there should be no commercial exploitation of the remedy. The process of preparation has been patented and rights of manufacture are provided to the Government of each country and to a responsible institution nominated by the Government.

Sir Robert Falconer proposed the toast to Doctors Banting and Macleod who in turn fittingly and feelingly responded. Stress was laid upon the value and necessity of team work in the carrying out of important research and attention was directed to one table at which were seated twenty-six who had all contributed to the successful issue in the production of insulin.

Professor Barker of Johns Hopkins brought the greetings and congratulations of all Toronto University Medical Graduates residing in the United States. He compared the fate of diabetics of only two years ago to those of the present time. In the one case an outlook of suffering, disability and death; at the present time a diabetic could "eat, drink and be merry," and on the morrow, not of necessity, die.

The Premier of the Province of Ontario was unavoidably absent and was represented by Attorney-General W. F. Nickel who in a brilliant speech described the enthusiastic interest displayed by the Legislature in the marvellous work recently accomplished in the laboratories of the University. Other public bodies were represented, *i.e.*, the College of Physicians and Surgeons of the Province of Ontario and the Canadian Medical Association. The meeting was a most enthusiastic one, all reference to the work of Banting and his associates being cheered to the echo, and upon rising to speak Doctors Banting and Macleod met with an ovation.

J. J. R. Macleod, M.D., D.P.H., F.R.C.S., F.R.S., Professor of Physiology, University of Toronto, was the guest of honour at a banquet tendered him Monday, November 5th at Hart House, on the occasion of his return from Edinburgh where he delivered the Cameron Lectures in Physiology. There were seventy guests representative of the medical profession who responded to the invitation sent out by Dr. Robert T. Noble, several coming from different parts of the province. The toast to the guest of the evening was fittingly proposed by Dr. Noble, and ably supported by Dr. H. B. Anderson, to which Professor Macleod replied. We hope to publish Professor Macleod's reply in full in our next issue.

WESTERN PROVINCES' CONFERENCE.—On Friday, November 16th, 1923, there was held at the Royal Alexandria Hotel, Winnipeg, a conference of representatives of the four Western Provinces, the meeting being attended by the following:—Dr. A. S. Munro, Vancouver, representing British Columbia; Dr. E. W. Allin, and Dr. A. F. Anderson of Edmonton, representing Alberta; Dr.

T. M. Leask and Dr. A. MacG. Young of Saskatoon, representing Saskatchewan; Dr. T. Glen Hamilton and Dr. Gordon S. Fahrni of Winnipeg, representing Manitoba. Dr. E. S. Moorhead of Winnipeg, President of the Winnipeg Medical Society, acted as host, while there were present, on behalf of the C.M.A., the President, Dr. J. F. Kidd of Ottawa, and the General Secretary, Dr. T. C. Routley of Toronto. The purpose of bringing representatives of these four provinces together was to discuss ways and means by which they could best co-operate, one with the other, and also with the C.M.A., in the interests of the members of their respective Medical Associations. During the ten hour conference which ensued, a great many problems were thoroughly discussed, and it was the unanimous opinion of all present that the exchange of views and opinions, and the expression of the various ideas which were presented would have a far-reaching effect upon the coordination of the medical activities of all those concerned. In deciding to hold the annual meetings of the provinces in consecutive order, immediately following the meeting of the C.M.A., an advance step was taken. It is hoped by such action that many of the outstanding medical men of Great Britain and our own country, who will take part in the annual meeting at Ottawa, will find it possible to travel westward and take part in the meetings in the other four provinces. In this manner, a much larger number of practitioners will have the privilege of enjoying the talent available, whereas long distances with concomitant expenses make it impossible for any large percentage of practitioners in Canada to attend any one medical function. The meeting dates, as tentatively decided upon, are as follows:—Canadian Medical Association, in conjunction with the Ontario Medical Association, Ottawa, Ont., June 17-20, 1924; Manitoba Medical Association, Winnipeg, Man., June 23-25; British Columbia Medical Association in conjunction with the North West Pacific Medical Association, Vancouver, B.C., June 26-28; Alberta Medical Association, Edmonton, Alberta, July 2-4; Saskatchewan Medical Association, Moose Jaw, Sask., July 8 and 9. In addition to the decision made reference meeting dates of the respective provinces, the conference discussed problems of medical legislation, medical education, medical economics and allied subjects, all of which are of particular interest to the medical profession of the entire Dominion. Meetings of this character auger well for the future of a strong national association of the practitioners in medicine in Canada.

On October 12th there was organized in the New York Academy of Medicine "The American Association for the Study and Cure of Cancer." There were over 60 enrolled from eighteen different States of the Union and some from outside countries, as charter members. The next annual meeting will be held in Chicago, in May, during the meeting of the American Medical Association.

NOVA SCOTIA

The faculty of medicine of Dalhousie University has been formally registered by the Board of Regents, New York State Department of Education, as an approved school of medicine.

Dr. G. J. Cassidy, lecturer in physiology at McGill University, has been generously "loaned" to Dalhousie, and is carrying on Professor Harris' classes most acceptably.

Among the Nova Scotians in attendance at the recent Congress of the American College of Surgeons, were Drs. J. G. McDougall, George H. Murphy, and V. L. Miller of Halifax, and Dr. Ross Miller of Amherst.

The serious illness of Dr. Fraser Harris, Professor of Physiology at Dalhousie University, has caused a host of admiring friends the deepest concern. Professor Harris is well known for the unusually attractive manner in which he carries on his teaching, for his intense industry, and for his wonderful versatility. In his illness, he has had many evidences of the loyal affection of his students and professional associates, as well as of the citizens of Halifax in general. It is gratifying to have the assurance that he is progressing favourably, and that, after a reasonable rest, he will be able to resume the work to which he is devoted.

The first meeting of 1923-1924 session of the Halifax Medical Society, held on the tenth of October, took the form of a dinner, at which Dr. M. G. Burris delivered the presidential address—a scholarly and thoughtful effort, which took the members in fancy far into the future, and anticipated the time when many of the riddles of to-day will be solved, and the practice of medicine conducted on a plane very different from that of the present. At the second meeting, held on the twenty-fourth, Dr. H. B. Atlee discussed the more modern methods of treating gonorrhoea in the female, pointing out the futility of the measures now commonly employed, and indicating the lines of treatment which give reasonable assurance of prompt and certain cure.

Every month, the Department of Public Health, Nova Scotia, issues a modest publication entitled "Public Health Notes," for circulation among physicians only. In the October number, a summary is made of the vital statistics of the province for the first half of the current year. This indicates that the statistics for the full year will again show fairly satisfactory general death and infant mortality rates, while the tuberculosis death rate will be substantially better than that of any previous year. There has been a steady decline in the tuberculosis rate for several years past, but it is still distressingly high, and the Department, so ably administered by Dr. Jost, is fully warranted in continuing to give particular attention to efforts aimed at its reduction. Infantile paralysis has been more prevalent of late than for several years, the cases being wide spread and with little traceable connection. In respect of other communicable diseases, there is little difference from what we are rather strangely in the habit of terming normal. W. H. H.

QUEBEC

Lady Roddick has donated the sum of $50,000 for the erection of a handsome entrance to the grounds of McGill University on Sherbrooke St. in memory of her husband the late Sir Thomas Roddick.

Dr. William McClure, (1884 McGill) a former Medical Superintendent of the Montreal General Hospital (1885-1888) is on furlough from China with a travelling fellowship of the Rockefeller Foundation. He holds the appointment of Professor of Medicine in the Medical school of the Christian University, Shantung, China.

Dr. and Mrs. D. H. Ballon have returned from a four months' trip to Europe.

Professor Arthur Biedl of Vienna gave an interesting address on Organotherapy to the members of the Montreal Medical Society.

The professors of the Faculty of Medicine of the Laval University gave a dinner to Dr. Grondin, on the occasion of his departure for Paris, where he will assume the position as director of French Canadian students in Europe.

Dr. A. R. Pennoyer, lecturer in surgery at McGill University, a well-known practitioner and surgeon in Montreal, has been appointed medical advisor of the Bell Telephone Company of Canada succeeding the late Dr. G. A. Winters. Dr. Pennoyer enters upon the duties of his new appointment immediately.

Dr. Raymond Paquin was taken ill in New York and is now in a critical condition in the Notre Dame Hospital, Montreal. Dr. Paquin graduated last year from Laval University and had been attached to the Metropolitan Hospital in New York to follow special courses, when he fell ill and had to be operated on. He is only twenty-four years old and is well-known in Montreal.

The Montreal Diet Dispensary has secured the services of a trained dietitian, Miss Jean Crawford, (Graduate of Macdonald College, P.Q., and Montreal General Hospital) who will supervise all diets and foods issued by the Society. Cases requiring light nourishment, special food for metabolic diseases, etc., may be referred to the Dispensary. These foods will be furnished upon reasonable notice at proportionate prices.

Drs. E. W. Archibald and C. F. Martin represented McGill at the Tri-State Medical Association Meeting at Des Moines, Iowa, on October 29th, 30th, 31st and November 1st, 1923. Nearly two thousand doctors attended the meeting, which was addressed by a large number of men from the various medical schools in America. A body of two or three hundred members of this Association contemplate a tour of the larger cities of Canada and the British Isles next year, in order to visit the various clinics and learn British methods. Toronto and Montreal will be included in this tour.

One of the outstanding benefits of the medical inspection in Montreal schools, which has been resumed with the opening of the new school year, is that it has prevented any serious outbreak of contagious disease in the city schools, was the comment made by Dr. Boucher, director of the Health Department, when he was asked for some information on the operation of this branch of his department. The staff of nurses and doctors of last year is carrying on as usual he said, though they have an increase of 4,000 children attending the schools of Montreal. The need of maintaining this supervision of the schools is generally recognized by the public. The work the doctors and nurses are doing consists not only in the search for disease among children and in case disease is found the notification of their parents that their children must be seen by their family physician and be treated, but also in the education of the children in matters of hygiene and in the prevention of the development of contagious diseases. G. H.

ONTARIO

On October 13th, Dr. W. E. Gallie of Toronto, addressed the Sault Ste. Marie Medical Society on Orthopaedic Surgery.

Dr. D. E. Robertson of Toronto, addressed the Peterborough Medical Society on October 18th, on "Acute Abdominal Conditions in Children."

On October 18th, Dr. R. W. Mann addressed the Perth County Medical Society in Stratford, on "The Treatment of Diabetes Mellitus."

Dr. J. W. Crane of London, addressed the Sudbury Medical Society on October 18th, on "The Treatment of Nephritis."

The Perth County Medical Society met at Stratford on October 25th; an address was given by Dr. H. S. Hutchinson of Toronto, on "The Modern Treatment of Nephritis."

The Oxford County Medical Society met at Woodstock on October 17th; an address was given by Dr. John A. Macgregor of London, on "Some Side Lights on So-called Indigestion."

The Lincoln County Medical Society met at St. Catharines on October 19th. Dr. E. A. Morgan spoke on "Some Common Errors in the Diagnosis of Acute Conditions in Infancy."

At a meeting of the York County Medical Society held on October 25th, at Woodbridge, Professor A. Hunter of the University of Toronto spoke on "Recent Advances in the Science of Nutrition."

On October 25th, the Peterborough County Medical Society was addressed by Dr. W. T. Connell of Kingston, on "Pernicious and Grave Anaemias."

At a meeting of the Ontario County Medical Society held on October 24th, the following addresses were given:—"Sinus Infections following Influenza," by Dr. P. Goldsmith of Toronto; and "Problems of Infant Feeding," by Dr. A. W. Canfield, Toronto.

The Number 4 District comprising the counties of Haldimand, Halton, Wentworth, Lincoln and Welland, held a district meeting under counsellorship of Dr. F. W. E. Wilson, Niagara Falls, Counsellor for the 4th District, on Wednesday, November 7th, at Hamilton. In the morning a clinic on Rectal Diseases was held at Hamilton General Hospital, by Dr. S. G. Gant, of New York City. In the afternoon at the Royal Connaught Hotel the following interesting programme was carried through with promptness:—Dr. Harold D. Storms, "Postural Treatment"; Dr. F. B. Bowman, "Remarks on Prognosis of Syphilis"; Dr. J. E. Davey, "Remarks on Medical Inspection of Schools"; Dr. T. W. Blanshard, "Effect of Intestinal Pathology on Gastric Radiography, with exhibition of plates"; Dr. T. C. Clark, "Acrodynia—Report of case"; Dr. R. Y. Parry, "Acute (?) Diabetes"; Dr. Rowswell Park, "Radium Treatment"; Dr. J. Heurner Mullin, "Unusual Cases of Diabetes"; Dr. James Roberts, "Present Status of the Schick Test." In the evening a banquet was held at the

Royal Connaught Hotel immediately after which addresses were given by the President of the Association, Dr. Argue of Ottawa, and by the Secretary, Dr. T. C. Routley of Toronto. Both addresses outlined the work being carried out by the O.M.A., and a very keen interest was shown by the medical men present in the work as outlined. After this, Dr. Gant gave two addresses on rectal subjects illustrated by moving pictures. The meeting was a great encouragement to those who have watched the steady growth of the Ontario Medical Association. Gradually men are realizing that in the Ontario Medical Association they have an organization which is on the alert for their best interests, and the future of the Association in this district is assured.

The Kingston and Frontenac Medical Society were hosts for the annual meeting of District No. 7, Ontario Medical Association, under Chairmanship of Dr. L. J. Austin, District Counsellor. The meeting in the afternoon at the General Hospital took the form of a clinical conference. Thirty-one members were present, besides Drs. Argue and J. H. Laidlaw of Ottawa, and Dr. Routley of Toronto. *Dr. Austin* showed a case of (1) Achondroplasia—boy of 12 years. (2) Extensive (?) syphilitic ulcer front of right knee. *Dr. Miller* showed photographs and autopsy specimens of a case of neurofibromatosis or Von Recklinghausen's Disease. *Dr. W. T. Connell* showed two cases of "Pseudo-hypertrophic muscular dystrophy, one in boy of seven, the other in adult, now 37. *Dr. Hopkins* showed six cases of chronic chest trouble to emphasize the fallacy of depending too much on inspection as an aid to physical diagnosis of chest conditions. *Dr. MacKay* showed two cases of bronchiectasis and illustrated the effects of posture in assisting drainage. *Dr. Volume* showed two cases of tuberculosis showing râles only after coughing, following full expiration. *Dr. MacGregor* showed a baby with congenital syphilis and discussed treatment of same; also, a pathological specimen from a baby with congenital atresia of the ileum. These cases were discussed by the members present. The meeting then adjourned to the Frontenac Club for dinner, at which fifty sat down. After dinner, addresses were given by Dr. Argue, President, and Dr. Routley, Secretary, on the Association work and activities. The evening concluded with an illustrated address on "16th Century Surgery," by Dr. Austin.

MANITOBA

The annual meeting of the Manitoba Medical Association was held this year at Brandon on October 10th, 11th and 12th. The program and the manner of its execution indicated excellent organization. The guests were taken care of from arrival to departure, and were accorded a warm welcome and were made aware of all that was taking place.

The first session was held in the Brandon Hospital, and by lunch time the party numbered 83. This number continued to grow during the afternoon until in the evening 109 sat down to dinner at the Prince Edward Hotel. After dinner was finished, Dr. S. J. S. Pearce of Brandon, delivered his presidential address on "Men and Things," dealing with prominent men in medicine and with the progress of events in medical science. He paid a high tribute to the work of Pasteur, placing him among the first four most notable figures of medical science in the last century. Among others he alluded briefly to the work of Copernicus, stating that it was not generally known that he was a physician, as he is better known as an astronomer, mathematician and philosopher.

He paid an affectionate tribute to the memory of the late Dr. Gordon Bell whom he described as one of the "joy-riders" of science in the sense that Dr. Bell pursued his scientific calling from pure love. He was a gallant gentleman and a true sportsman. The President then spoke of the many great advances made in modern medicine and referred especially to insulin, a Canadian discovery of the greatest benefit to mankind generally. He also quoted some recent British findings indicating that cancer may be developed from the irritation produced by tarry materials.

He referred also to the successful opposition made to the attempt of osteopaths to obtain a license in Manitoba at the last session of the legislature. No concessions whatever had been made to the unqualified, and he predicted that the cult founded upon a false doctrine would die with the present generation. In order to maintain their position they were already forced to bring themselves into line with scientific medicine. In his opinion the cult of the chiropractics would also die in the same way, as it contained within itself the seeds of early dissolution.

The President called attention to the improper use of the mail serivce by nostrum and cure-all merchants. He had taken this matter up with the postal authorities, but was unable to obtain any satisfaction from them. They merely passed the matter along from one department to another.

Dr. Routley, the secretary of the Canadian Medical Association, was present by invitation. He was on his way west to help in the organization of some new districts in Saskatchewan, and was able to spend only a short time in Brandon. In addressing the meeting, Dr. Routley stated that he was willing to admit that the profession had hitherto paid little attention to anything except scientific medicine, but in stating it he regarded it as a compliment to the profession showing its inherent unselfishness. Doctors are notoriously bad business men, but they must learn to take proper charge of their own affairs. It was dangerous not to do so, as it is the policy of the state to take over the affairs of those within it who refuse to take care of their own.

Dr. Routley touched briefly on medical education, asking who is likely to be the best judge of pre-medical requirements; surely the physician. The length of the under-graduate course is being periodically increased, and the most thoughtful in medicine would be the last to turn back the clock and lower the standard of graduation or decrease the time required by the student to cover the course demanded.

In the past, few universities took further interest in the student after his graduation. This now has been completely changed, and there is a growing tendency on the part of all university authorities to follow the graduates in their after-career; and owing to the rapid advances in all departments of science, to enable him to add to his education and to increase his efficiency and value to the nation.

He regarded it as unworthy of the profession the fact that the public know so little of the continued advance of medical science. It is sometimes said that medicine is being commercialized; but as to what medicine is doing for the people little or nothing is heard. The public have a duty to the profession. If they do not realize that fact it is chiefly because they have no data for appraising the value of the services of the profession. This is the fault of the profession.

What is our quarrel with chiropractors and osteopaths? We have no quarrel with any cult, excepting in so far as it preys upon a gullible public. Our opponents say that we wish to create a monopoly. The truth is that we only insist in the public interest that anyone who treats the sick shall have sufficient knowledge of the anatomy and physiology of the human body and of scientific medicine that his patients shall have a fighting chance of recovery. Our attitude is misunderstood because we have not effectively placed the facts before the public. One of the best methods of making our case known is through various societies and the organizations of the ladies.

The speaker read extracts from the prospectus of a chiropractic training school offering to qualify its students in seventy-five days. Their chief bait appeared to be that they would turn out in the short time given, men who would be on the same level as physicians who had spent many years in the study of medicine. Is it right that the public should be fooled in this way and left ignorant of the truth?

Dr. Routley mentioned what had been done by the C. M. A. in regard to the standardization of drugs, and urged the necessity of having each province in the Dominion represented at all the Council meetings.

Mr. W. G. Hunt, secretary of the Alberta Medical Association, spoke on the need for educating the public in medical matters, and keeping the profession clean within. He suggested that there should be uniform methods for this between the various licensing bodies in all the provinces. He thought this would be of service in preventing unprofessional conduct.

It had been arranged that the members should go to Ninette Sanatorium for the second day of the meeting. The weather, however, prevented this, and instead it was resolved to go to the Brandon Mental Hospital where a very full programme had been prepared for the last day of the meeting. The papers proved in the highest degree interesting, and were illustrated by a number of clinical cases.

At the business meeting in the afternoon the question was raised whether the provincial associations should urge the Workmen's Compensation Boards to take care of men who moved from one province to another while still incapacitated after receiving injuries, and that medical fees for attending such cases should be paid. The matter was referred to the executive committee.

A letter was read suggesting that the western provinces should hold their annual meetings consecutively in 1924 in order to take advantage of the visit of some prominent British physicians. It was felt that the fall was the best time for the annual meeting of the M.M.A. The matter was referred to the executive committee, who were asked to take into consideration the whole of the circumstances. It was thought that the association might co-operate with the Winnipeg Medical Association in entertaining the visitors.

In regard to the proposed visit of the British Medical Association, correspondence had already passed between the C.M.A. and the B.M.A., in which the latter was invited to meet in Canada in 1926, but the B.M.A. stated that the earliest date at which they could come would be 1927. In view of this at the recent annual meeting of the C.M.A. a resolution was passed to the effect that the British Medical Association was to be invited to hold its annual meeting in Winnipeg in 1927. Although it was known that there is a growing desire on the part of members of the B.M.A. not to meet outside the British Isles, an invitation from Canada would be received with the greatest pleasure. It would be necessary in the near future to send invitations to the B.M.A. from the C.M.A. asking them to meet in Canada in 1927; from the M.M.A. and Winnipeg Medical Society asking them to meet in Winnipeg. The last named body would be the hosts of the B.M.A. The Hon. Sec. was instructed to invite the B.M.A. to Manitoba in 1927.

Dr. Routley pointed out that the C.M.A. met in different provinces each year, and so far the business meetings had not been sufficiently representative of the whole of the Dominion. To overcome this difficulty it was suggested that the expenses of one man from each province should be paid yearly. After some discussion it was agreed to pay the expenses for this purpose.

Election of Officers.—A ballot was taken and the following officers were declared elected: Dr. Gordon S. Fahrni, Winnipeg, President; Dr. Ross Mitchell, Winnipeg, Vice-President; Dr. W. J. Elliott, Brandon, 2nd Vice-President; Dr. N. W. Warner, Winnipeg, Hon. Sec.; Dr. W. L. Mann, Winnipeg, Hon. Treas.

Executive.—The new clause of the constitution was put into effect, and it was decided to re-elect four members of the present executive for one year and four new members for a period of two years. Re-elected for one year:—Dr. T. G. Hamilton, Dr. D. S. McKay, Dr. J. S. Poole, Dr. W. S. Peters. Elected for two years:—Dr. S. J. S. Pierce, Dr. D. A. Stewart, Dr. N. J. Maclean, Dr. A. M. Davidson.

The president appointed Drs. H. W. Wadge and J. D. Adamson, auditors.

A committee was appointed to assist Dr. N. J. Maclean, local chairman of the American Society for the Control of Cancer in propaganda work during "Cancer month." In the evening, papers on tuberculosis were given in the lecture hall of the Brandon Mental Hospital. About two hundred were present including the staff of the hospital.

The last session of the meeting was held in the Brandon Mental Hospital. After an inspection of the institution further papers dealing with mental diseases were read, and a large number of cases were again presented. The meeting concluded at noon. One experienced practitioner stated that the meeting had been conducted throughout with greater punctuality than any medical meeting he had ever attended, and the Brandon doctors received the hearty thanks of all the visitors.

In the evening a public meeting was held, which was well attended. A moving picture film "The Reward of Courage" was shown. This event concluded the meeting.

BRITISH COLUMBIA

VICTORIA MEDICAL SOCIETY

At the regular monthly meeting of the Victoria Medical Society held in the Library Rooms on Nov. 5th, Dr. M. W. Thomas read the report of the special committee of the British Columbia Medical Association on Health Insurance. A free discussion followed and the interest shown proves that the profession in this province has become convinced of the necessity of informing themselves on this important subject. The report was formally presented to a special meeting of the British Columbia Medical Association on October 10th, by Dr. Lyle Telford of Vancouver, chairman of the special committee. The committee was highly complimented for the large amount of information collected, making the report a valuable contribution to our knowledge of this subject.

The annual meeting of the British Columbia Medical Association was held in Vancouver, July 3rd and 4th, and was well attended. Among the many matters discussed was the report of the Industrial Service Committee on the railway dispute. It was finally decided that the inclusion of families and dependents in railway contracts was an exploitation of the medical profession and must be eliminated. The report from Dr. Lyle Telford, Chairman of the Central Committee was received on a scheme for taking care of people with limited incomes which it was hoped would solve the question of the pernicious contract problem which was so rife in the province. The following are the officers for the ensuing year:—President, Dr. George Hall, Victoria; Vice-President, Dr. H. McGregor, Penticton; Immediate Past President, Dr. R. E. Walker, New Westminster; President Elect, Dr. C. H. Vrooman, Vancouver; Sec. Treasurer, Dr. J. H. MacDermot, Vancouver; Executive Secretary, Mr. C. S. Fletcher, Vancouver. *Executive Committee.*—Dr. J. A. Gillespie, Vancouver; Dr. E. J. Rothwell, New Westminster; Dr. H. H. Murphy, Kamloops; Dr. L. E. Borden, Nelson; Dr. F. W. Drysdale, Nanaimo; Dr. H. E. Tremayne, Prince Rupert; Dr. M. G. Archibald, Kamloops; Dr. C. S. Williams, Trail; Dr. G. K. McNaughton, Cumberland.

The summer School of the Vancouver Medical Association was held during the early days of July. The lecturers were Dr. Henry A. Christian of Boston, Dr. Carl B. Davis of Chicago, and Dr. Andrew Hunter of Toronto. Dr. Howard Fox of New York gave an address on "The Modern Treatment of Skin Diseases." Dr. F. W. Marlowe spoke on "Symptomatology of Pelvic Diseases," and Dr. F. J. Tees of Montreal demonstrated the newest methods of treating fractures. Towards the close Dr. Routley addressed the members on the aims and objects of the Canadian Medical Association.

It is now two years since the re-organization of the B. C. Medical Association. The following facts speak well for the work which has been accomplished during that time:—In January, 1921, there was a membership of 144; in August, 1921, immediately after the reorganization, a determined effort was made which brought the membership up to 295. To-day there are 470 members out of 500 men actively practising in the province. Although the association may be considered as still in its infancy, a number of economic reforms affecting the profession as a whole have been dealt with, whilst numerous individual grievances have been settled or adjusted satisfactorily.

The Educational and Publicity Committee is busy preparing for an intensive "Health Compaign," not only through the columns of the press, but on the public platform. The unqualified success of a similar compaign put on a year ago justifies the assumption that the public are ever anxious to learn all they possibly can in regard to the prevention of disease from those most fitted to teach.

Dr. W. A. Clarke, who, since his return from overseas in 1918, has been empoyed as Assistant Unit Medical Director to the Soldiers' Civil Re-establishment, has relinquished that position and is now engaged in private practice at New Westminster as a partner of Dr. T. B. Green. Dr. Clarke will be greatly missed in Vancouver medical circles where his indefatigable work with the Vancouver Medical Society and the provincial Association will not readily be forgotten.

An innovation, in the shape of a monthly luncheon, has been inaugurated by the B. C. Medical Association. The first of the series was held on the 5th of November in the Hudson's Bay Dining Room when an attendance of 75 medical men listened to a very excellent address from Alderman Pettipiece on "The Attitude of Labour towards Health Insurance." It is hoped that Mr. E. S. H. Winn, Chairman of the Workman's Compensation Board, will be the speaker at the next luncheon. His views on "Health Insurance" should prove both interesting and instructive, and a record attendance is expected.

The Vancouver General Hospital Board is to be congatulated in having secured the services of Dr. Fred C. Bell of Winnipeg, as General Superintendent of the hospital in succession to Dr. M. T. MacEachern. Dr. Bell comes to Vancouver with an excellent reputation as a medical man and administrator as well as with a distinguished overseas record. His varied experience as medical superintendent of the Winnipeg General Hospital and later, on his return from the war, as director of records at that institution should prove of inestimable value in his new position. Whilst overseas, Dr. Bell was administrator of the Canadian Special Hospital at Ramsgate, 1,100 beds, from which position, in 1916, he was transferred to London headquarters in charge of hospitalization and allied services. Dr. Bell is a western Canadian by birth and a graduate of the University of Manitoba (1909).

It was decided that the Victoria Society would in the near future undertake another "Health Week," somewhat similar to that held in 1922. At that time a large auditorium was provided and public meetings were addressed on health problems. Among the subjects discussed were, tuberculosis, cancer, social hygiene, preventive medicine and milk. Three doctors covered different phases of each subject and drew crowded houses. The greatest publicity was gained by securing full press reports of all the addresses and free editorial discussions.

The annual meeting of the Victoria Medical Society was held in the Library Rooms, Compbell Building, on October 1st. The president, Dr. Hermann M. Robertson, presiding. The election of officers resulted as follows:—President, Dr. M. J. Keys; Vice-President, Dr. Walter Bapty; Hon. Secretary-Treasurer, Dr. Gordon C. Kenning. The library committee will be composed of the executive committee and the following three members:—Dr. Forrest Leeder, Dr. George Hall, and Dr. M. W. Thomas. The society has been very active and the library is showing steady growth and is much appreciated by the local profession. Doctors M. J. Keys, George Hall, and F. M. Bryant, have been in Chicago attending the congress of the American College of Surgeons. They are visiting other eastern centres and the Mayo Clinic before returning.

Book Reviews

Notes on Medical Treatment of Disease. For Students and Young Practitioners of Medicine. By Robert Dawson Rudolf, C.B.E., M.D. Edin., F.R.C.P. Professor of Therapeutics, University of Toronto; Fellow of the Royal Society of Medicine, Member of the Association of American Physicians, Late Consulting Physician Canadian Forces Overseas. Second Edition. Price $5.00. University of Toronto Press, 1923.

We welcome with pleasure a second and revised edition of this excellent and very practical volume, presenting modern views on the treatment of disease both in their general principles and in their special applications. An introductory chapter gives a brief but interesting sketch of the evolution from early times of the various systems of therapy, emphasing the value and power of the *medicatrix naturae*. An excellent chapter follows on the management of the sick, which should be read by every senior student. In it the writer lays down a modified routine for dealing with every patient. Beginning with the diagnosis which so far as practicable should always be made first, the surroundings as it affects his illness must then be considered and necessary changes made. A diet suitable to his condition is to be prescribed, then treatment for the specific cause if that is possible, and finally treatment for disturbing symptoms. In speaking of symptomatic treatment Dr. Rudolf quotes the physiologist Haldane who, writing of the administration of oxygen in inflammatory conditions of the lungs, says, "It may be argued that such measures as the administration of oxygen are at best only palliative and of no use since they do not remove the cause of the pathological condition. As a physiologist I cannot for a moment agree with this reasoning; the living body is no machine, but is constantly tending to maintain or revert to its normal, and the respite afforded by such measures as the temporary administration of oxygen is not wasted, but used for recuperation." Rudolf adds very truly "a symptom is usually a link in a vicious circle and if we can break that link the patient may get well."

Chapters follow on the care of fevered patients, with special remarks on the treatment of enteric fever, on immunity, and on the treatment of the several specific infectious diseases. The treatment of the various diseases of the respiratory system is fully discussed, and prescriptions for special conditions are given. Diseases of the circulatory system, the digestive system, the urinary, and the nervous system follow. The value of the use of oxygen in conditions of respiratory distress is clearly stated. Symptoms demanding venesection are detailed and careful directions are given for the use of digitalis and of quinidin sulphate.

The volume is a small 8vo. volume of 450 pp., well printed on good paper. We can strongly recommend it.

Standard Methods for the Examination of Water and Sewage.—Fifth Edition. Published by the American Public Health Association.

All public health laboratory workers will welcome the latest edition of the Standard Methods for the Examination of Water and Sewage. Excellently arranged and well printed on a good quality of paper this edition is a worthy successor to the previous edition. Many minor changes are noted, not the least of which is a change in arrangement which separates method of water analysis from the methods of sewage analysis. Calculations from the International Atomic Weights, 1921-1922, have resulted in many slight changes in standard solutions. Many methods for calculating final results included in previous editions have been omitted. Comparisons of colour with the Lovibond Tintometer or with Nessler Standards are no longer official methods. Previous methods allowed the use of glass or metal still for the determination of ammonia, while the new methods require the use of glass flasks.

In the determination of organic nitrogen the addition of KMnO4 after digestion of water or sewage is no longer recommended. The new standard nitrate solution is ten times stronger than the old.

In the phenol di sulphonic acid method of nitrate determination the new method calls attention to the fact that in the removal of chloride most waters suffer an appreciable loss of nitrate nitrogen if heated with silver sulphate solution, therefore the standard silver sulphate is added to the cold solution.

On page 28 we note the use of the term "beverage alcohol" where the designation "ethyl alcohol" would be more definite and more scientific.

The method for determining temporary hardness by titration with acid is omitted, new indicators for alkalinity and acidity are recognized and a section is devoted to hydrogen ion concentration, with a method for its colorimetric determination. The orthotoludine method for the detection of free chlorine is made official.

Weaker permanent standards for iron are recommended. H2SO4 is used instead of HCl to liberate iodine in the dissolved oxygen determination.

Three methods are given for the quantitative estimation of potassium, and methods for the quantitative estimation of lithium, bromine, iodine, arsenic and boric acid have been omitted.

Methods for the analysis of sewage and sewage sludge have been subjected to minor changes bringing them up-to-date without actually introducing new methods. No changes have been made in the microscopical examination of water.

Under bacteriological examination of water fermentation tubes are required to hold three times as much medium as water to be tested instead of four times as much medium as water. The reaction of culture media is adjusted to a definite hydrogen ion concentration by the phenol-red method instead of titration with phenolphthalin. The most noteworthy change in the bacterial methods is the substitution of eosin-methylene-blue agar or Endo's medium for litmus lactose agar. Whether the elimination of litmus-lactose agar as a standard method for the identification of the colon group marks an advance in the bacteriological methods of water analysis remains to be proven. Litmus-lactose agar is an easy medium to prepare and its use as a laboratory method has been thoroughly demonstrated over a period of many years. Many laboratory workers will consider that it might well have been left as a provisional method, especially as both Endo's medium and eosin-methylene blue agar seem to be much less adaptable to routine laboratory work on a large scale. A. J. S.

Applied Pharmacology by A. J. Clark, B.A., M.D., F.R.C.P. 5¼ x 8½. p. viii 390. Price $5.00. J. & A. Churchill, London, 1923. McClelland & Stewart, Toronto.

The author of this small book has successfully attempted to bridge the gap between scientific laboratory pharmacology and the treatment of disease . His teaching shows not only how the scientific facts in regard to the action of drugs are obtained but also how these act in the human body, in the normal as well as the pathological state. It is an extraordinarily practical book, written simply and directly, and on the whole exceedingly sound in its teaching. It can be strongly recommended to any practitioner either physician or surgeon who is anxious to treat disease with knowledge and success. V. E. H.

Inflammation in Bones and Joints. By Leonard W. Ely, M.D., Associate Professor of Surgery, Stanford University. Octavo 433 pages, with 144 illustrations. Price $6.00 net. J. B. Lippincott Company, 201 Unity Bldg., Montreal, 1923.

This very readable volume comprises a discussion of the various inflammatory processes in bones and joints, and is of unusual interest since it presents the author's personal opinions based on extensive clinical and pathological investigations rather than a general survey of the subject. At the same time the opinions of others are by no means disregarded, and the bibliography appended to each section is unusually extensive.

The general make-up of the volume is excellent, the print clear and the illustrations good, except a few of the reproductions of roentgenograms.

While in some instances the author's opinions have not received general endorsation, it can at least be said that he presents valid arguments in their favour. It is of particular interest to note that he still holds that in the "Typical severe spreading osteomyelitis" the inflammation travels widely in the spongy bone in the general direction of the central marrow canal, gains this, and involves its marrow for a greater or smaller distince. E. R. S.

Surgical "Don'ts" and "Do's." By C. Hamilton Whiteford, M.R.C.S., L.R.C.P., Honorary Surgeon to the Plymouth Infirmary. Price 3s. net. London, Harrison and Sons, Ltd., St. Martin's Lane, W.C. 1923.

This small brochure of 46 pages presents a mass of surgical advice in such concentrated form that it is somewhat difficult to digest. It may be frankly admitted that most of the aphorisms herein contained are so self-evident as to need no proof. It is to be feared, however, that this very fact will lead the average reader to dismiss the book without serious thought, because his self-esteem will not permit him to admit that he can benefit by the simple suggestions offered.

If seriously considered, the work is invaluable, and perhaps one of the most striking paragraphs is "Don't attempt to justify indiscriminate operating by that feeblest of all excuses: 'If I do not perform this operation someone else will.' " E. R. S.

Journal of the Canadian Association of Massage and Remedial Gymnastics. Editor, Miss H. Hancock. Published bi-annually. Vol. 1, No. 1, 1923.

The first number of the Journal of the Canadian Association of Massage and Remedial Gymnastics has been received. It is well printed and interesting, and opens with a short account of the history of the Canadian association which proposes to celebrate its fourth birthday shortly. The association was incorporated by Dominion charter through the united efforts of the massage associations in Toronto and Montreal. Its membership now is almost 100, and its members are scattered over Canada. The association attempts to standardize the teaching of massage to nurses in training; also a series of lectures and demonstrations has been organized at the local branches. The association hopes to become as influential an agent in Canada as the Chartered Association of Massage and Remedial Gymnastics in England. Among the papers in this number is an interesting account of Hart House in Toronto, and of the important place which it took in the training of nurses for the Great War and in the restoration of so many of our wounded soldiers to a life of usefulness. An excellent paper is contributed by Dr. F. H. Mackay of McGill University on the influence of emotions in the production of organic disease. Dr. F. W. Harvey of the Montreal General Hospital contributes an interesting and most useful paper on "Lateral Curvature of the Spine" with illustrations, which deserves to be read by physician as well as nurse.

The final paper is a reprint of an excellent article on "Physiotherapy in Stiff and Painful Shoulders," by Dr. Frank B. Granger of Boston, containing many points of interest.

We wish the *Journal* every success, and we hope it will serve as a bond of union between all the members of its widely scattered association. A. D. B.

Syphilis. By Burton Peter Thom, M.D., Visiting Syphilologist to the Hospitals of the Department of Correction, Welfare Island, New York City. Octavo, 525 pages with 69 engravings. Price $5.50. Lea and Febiger, Philadelphia and New York.

This is an excellent monograph on the subject, and in its fifty-one chapters deals with every phase of this complex disease. The book is well written, free from verbosity, and expresses the personal views of the author in a clear and lucid manner. In discussing the prognosis of syphilis he enunciates the dictum "Unless we have changed a positive Wassermann reaction to a negative we have not cured syphilis" which appears to be sound teaching, but it is doubtful if the majority of workers will agree with his optimism with regard to the percentage of cases in which this desideratum can be achieved.

It is to be regretted that the chapter on treatment is comparatively so brief. He refers to arsphenamine and neoarsphenamine "or any of their congeners," but gives no indication as to which of the multitude of preparations he has personally found to be the most satisfactory. E. R. S.

A Text-Book on Minor Surgery. By John C. Vaughan, Director and Visiting Surgeon, Beekman Street Hospital, New York City, and Athel Campbell Burnham, M.D., Former Attending Surgeon, Department of Surgery, Vanderbilt Clinic. Octavo, 627 pages with 459 engravings. Price $7.75. Lea and Febiger, Philadelphia and New York.

It is obvious that it is difficult to distinguish between minor and major surgery, but it would appear that a volume with the above title should be largely devoted to a full discussion of those details of minor surgical conditions which by reason of their relative simplicity are more or less neglected in works devoted to major surgery, rather than to a consideration of the minor degrees of lesions which may, and usually do, assume major importance. If this idea were carried out it would avoid the frequent repetition of such phrases as "For extreme cases of— reference should be made to the text-books on major surgery."

In the treatment of Colles' fracture, two pages are devoted to splints, while reduction is dismissed with the mere statement that it is necessary. This is followed by the statement that "It is especially inadvisable in this fracture to expect the pressure from the splints to accomplish any appreciable result towards reduction." Examples of fracture where the pressure of splints is useful in this respect are not given for obvious reasons.

The typographical make-up of the book is excellent, the illustrations are good, but the subject matter is disappointing. E. R. S.

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pp. 70 and 100. Report of Joint Committee of Lister Institute and Medical Research Committee on "Accessory Food Factors (Vitamins)." H.M. Stationery Office.

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Books Received

Diseases of the Skin. By Robert W. MacKenna, M.A., M.D., B.CH. (Edin.) 451 pages, illustrated. Price $6.75. Published by McClelland and Stewart, Toronto.

The Ophthalmology of General Practice. By Malcolm Hepburn, M.D. (Lond.), F.R.C.S. (Eng.). 183 pages, with 40 colour and 9 half-tone illustrations. Published by Cassell and Company, Ltd. McClelland and Stewart, Limited, Toronto agents. Price $3.75.

Medical Treatment of Disease. By Robert Dawson Rudolf, C.B.E., M.D., (Edin.) F.R.C.P. Second edition. 486 pages. Price $5.00. Published by J. & A. Churchill, London, Eng. Toronto agents, McClelland and Stewart.

Physical Diagnosis. By Richard C. Cabot, M.D. Eighth edition, 536 pages, illustrated. Published by Messrs. William Wood and Company, New York.

Bergey's Manual of Determinative Bacteriology. First edition, 442 pages. Price $5.50. Published by Williams and Wilkins, Baltimore, Maryland.

Chemical Basis of Growth and Senescence. By T. Brailsford Robertson, Ph.D., D.Sc. 389 pages, illustrated. Price $3.00. Published by J. B. Lippincott Co., Montreal, Que.

Exercise for Health and Correction. By Frank D. Dickson, M.D. and Rex. L. Diveley, M.D. 127 pages with 112 illustrations. Price $2.00. Published by J. B. Lippincott Co., Montreal, Que.

Mental Hygiene and the Public Nurse. By V. May MacDonald, R. N. 77 pages, 12 mo. Price $1.50. Published by J. B. Lippincott Co., 201 Unity Building, Montreal, Que.

International Clinics Vol. III. By Henry W. Cattell, A.M., M.D. 312 pages, illustrated. Published by J. B. Lippincott Co., 201 Unity Building, Montreal, Que.

Histology and Histopathology of the Nervous System. By Dr. Paul Schroder. 161 pages, 53 illustrations. Price $3.50. Published by J. B. Lippincott Co., 201 Unity Building, Montreal, Que.

Habitual Constipation—Its Causes, Consequences, Prevention, and Rational Treatment. By Ismar Boas, M.D., Translated by Thomas L. Stedman, M.D. 12 mo. Cloth. Illustrated, 299 pages. $2.00 net. Funk and Wagnalls Company, Publishers, New York.

Rubber and Gutta Percha Injections. By Charles Conrad Miller, M.D. Illustrated, 99 pages. Price $1.75. Oak Printing & Publishing Company, Chicago, Ill.

Synovectomy of the Knee Joint in Chronic Arthritis.—Ellis Jones, Los Angeles, reports twelve cases of chronic arthritis of the knee joint in which the synovial membrane was dense and thickened, and in which there was evidence of trauma in almost every joint. In several cases, extensive erosion of the articular surfaces of the condyles was present, the articular surface of the tibia being relatively smooth. Adhesions were commonly found between the synovial folds in the lateral cul-de-sacs of the superior joint. Synovial fringes, fibrillation and derangement of the menisci together with hypertrophy of the alar ligaments and retropatellar pad, were almost constant findings. Pathologic reports showed chronic inflammatory tissue. Cultures were negative, and micro-organisms absent in stained specimens. Restoration of painless function occurred in every case after a synovectomy was performed. Relapse occurred in one case, badly selected, and recovery followed appropriate antisyphilitic treatment. Although synovectomy in the treatment of the chronic knee joint has distinct value, it must be definitely recognized that its application is limited and must be largely directed to the relief of a disabling condition only after persistent conservative methods have failed.—*Jour. Am. Med. Ass.*, Nov. 10, 1923.

The Contribution of Oral Lesions to the Cause of Cancer.—Joseph A. Pettit, Portland, Ore., asserts that few cases of malignancies of the oral cavity appear without a history of some preexisting oral lesion of either an inflammatory or a traumatic type. These facts and observations should give some credence to the theory that malignancies of other parts of the body may have some type of traumatic or bacterial irritation to cause an unphysiologic and unanatomic overgrowth of otherwise normal cells, disrupting the communistic organization existing in the local area to such an extent that a malignant tumour supersedes normal processes.—*Jour. Am. Med. Ass.*, Nov. 3, 1923.

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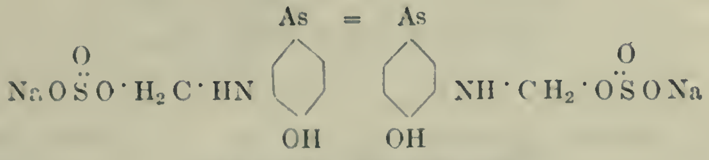

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(4) **Increased action.** If we judge by its effects on lesions that are visible, 12 centigramme of **Sulfarsenol** corresponds in its effects to about 20 centigramme "914." In accumulated doses **Sulfarsenol** is more efficient than any other arsenobenzol compound.

(5) **Guarantee.** Every product has been carefully verified and tested biologically before being sold. Its content in arsenic is approximately 21 per cent.

The colour of **Sulfarsenol** is pale yellow. Odour "sui generis" more or less strong and resembling that of sulphur.

If the ampoules are cracked and the contents have darkened in colour (dark orange), they should not be used, nor when the ampoules have been open more than a day.

Sulfarsenol is supplied in ampoules in the following doses. Distilled water can be supplied if required:

Dose	1	6	**Centigramme**	**Dose**	8	48	**Centigramme**
—	2	12	—	—	9	54	—
—	3	18	—	—	10	60	—
—	4	24	—	—	11	72	—
—	5	30	—	—	12	84	—
—	6	36	—	—	13	96	—
—	7	42	—				

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In small doses, of 2 centigramme, it is useful in cases of anaemia and in similar complaints where the tonic effect of arsenic is desired.

In animals it is useful in cases of spirochaetosis, trypanosomiasis, pasteurellosis, etc:

CONTRA-INDICATIONS are very few. It should not be used in cases of advanced tuberculosis, advanced disease of the heart, kidneys or liver, nor in severe diabetes or Addison's disease. It should be employed with careful dosage in any visceral disease, or disease of the central nervous system, the doses being small, increased very slowly and administered hypodermically or intramuscularly.

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Compound Fractures of Long Bones of the Extremities.—Seventy-five cases of fracture are analyzed by H. Earle Conwell, Fairfield, Ala. The series is divided into fractures of the femur, twelve; of the tibia and fibula, forty-four; of the humerus, eight, and of the radius and ulna, eleven. Eighty per cent. of these fractures were in the lower third of bone, and in a large proportion, neighbouring joints were involved; in almost 70 per cent. there was considerable destruction of soft parts. Ninety per cent. of these fractures were comminuted, and in more than 25 per cent. of these cases there was a decided question as to whether amputation was justifiable. The routine treatment in these cases was as follows: Immediately after arrival at the hospital, morphin is given, if necessary. After immediate inspection of the wound, and after the extremity has been properly splinted, temporarily, the patient is prepared for major operation, if the physical condition is good. In cases of shock, the patient is put to bed and given physiologic sodium chlorid solution subcutaneously in large quantities, or blood transfusion, if necessary, and other usual routine treatment used in cases of shock. As soon as the condition warrants, the patient is taken to the operating room. As a routine measure, a thorough débridement is done, consisting in the excision of all macerated and severely traumatized soft parts, with the removal of entirely loose pieces of bone and foreign material of any kind. Then bone fragments are approximated as carefully as possible, usually by periosteal suture with chromic catgut or kangaroo tendon. When this is impossible on account of extensive comminution, muscle suture should be depended on for approximation. Absolute control of haemorrhage in these cases following excision of traumatized soft parts is extremely important, and the end-result largely depends on it. As soon as the operation is completed, fixation apparatus is applied, usually a molded plaster splint for fractures of the leg or forearm, or a Thomas splint for fractures of the femur or humerus, combining the use of the Balkan frame, with proper traction. When the roentgen-ray and physical examinations show that enough callus has formed to prevent the slipping of bone, the plaster splint is frequently removed and active and passive motion, with massage and hot baths, is used. Conwell is thoroughly convinced that the sooner this secondary treatment is begun, the better are results, although one must be sure that there is sufficient union to prevent slipping of bone ends before regular massage is begun. It is an interesting fact that in over 90 per cent. of this series of fractures, the Wassermann test was positive on a blood specimen taken on the date of injury; but that the second specimen, taken from ten days to two weeks after the injury, was negative in a vast majority of cases. In cases in which the second test was positive, anti-syphilitic treatment was administered.—*Jour. Am. Med. Ass.*, Nov. 10, 1923.

The Therapeutic Value of Type I Anti-Pneumococcus Serum.—The fundamental experiments on which the treatment of lobar pneumonia with serum are based Arthur L. Bloomfield, Baltimore, says show that after the infection has progressed beyond a certain point, no amount of serum will save the infected animal. Evidence is presented by Bloomfield which seems to show that an analogous state of affairs exists in pneumonia in man, and that the best indication that the case is still favourable for treatment is the absence of bacteremia and not the day of the disease. Furthermore, the mortality figures on this basis bring out, in a much more striking way, the therapeutic value of the serum than general gross mortality statistics. The occurrence of bacteremia in relation to the day of disease affords an index for prognosis in lobar pneumonia. As long as the blood culture is negative, spontaneous recovery is possible in the majority of cases. In Bloomfield's series, the percentage of recoveries of patients treated with serum at a time when the blood culture was negative was 100, regardless of the day of disease. It is believed by him that his study reinforces the view that Type I antipneumococcus serum is of real value. The serum appears indicated in all cases, regardless of the day of disease, save those in which an overwhelming bacteremia is present.—*Jour. Am. Med. Ass.*, Oct. 27, 1922.

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Vol. XIII December, 1923 No. 12

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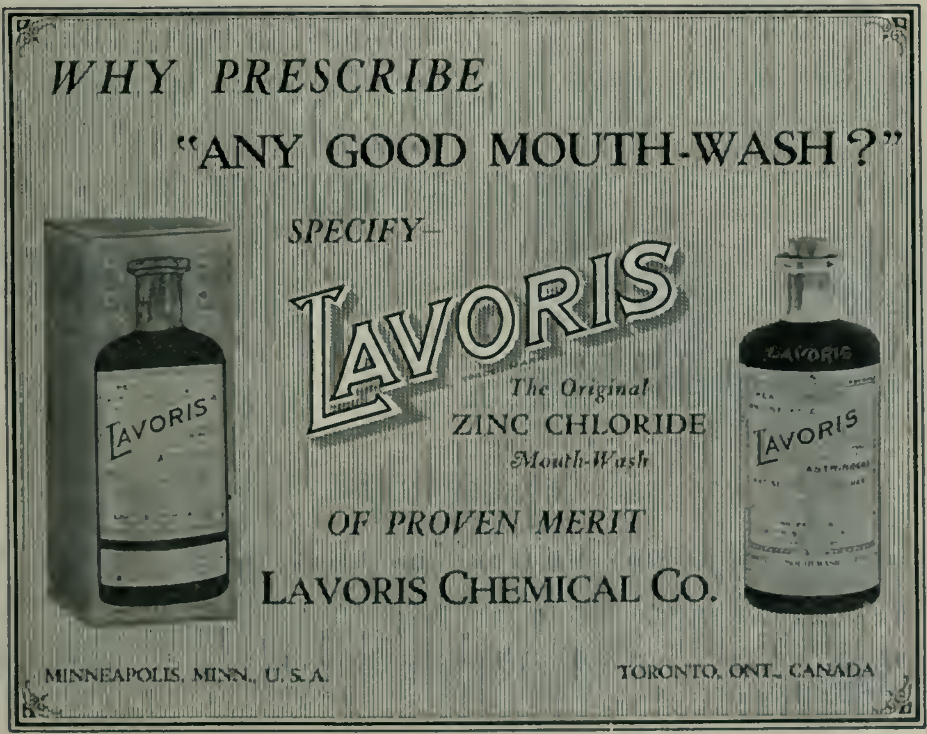

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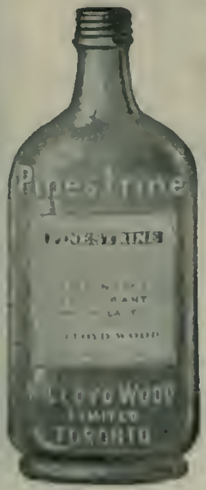

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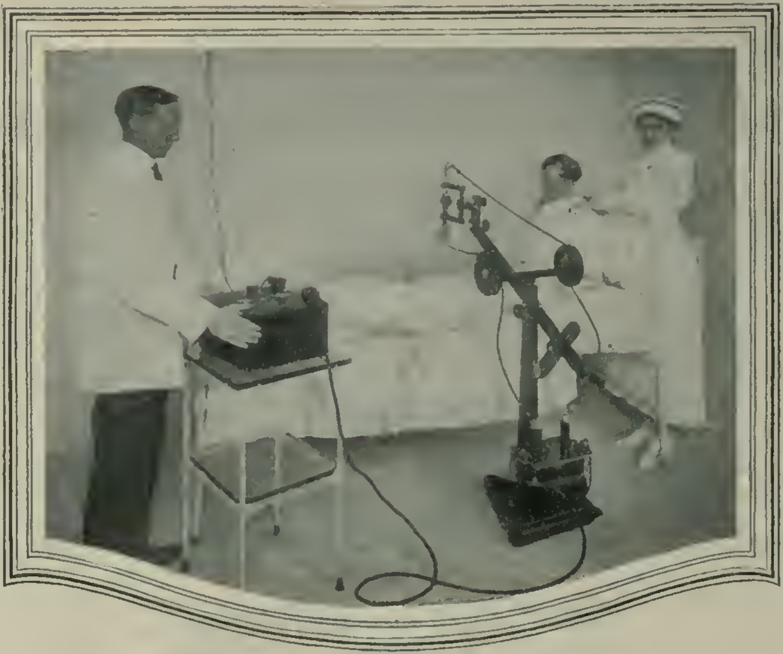

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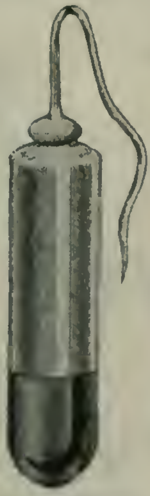

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